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Weapons labs and city growth: Livermore and Albuquerque, 1945-1975

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WEAPONS LABS AND CITY GROWTH: LIVERMORE
AND ALBUQUERQUE, 1945-1975

by

Layne Rochelle Karafantis

Bachelor of Arts
San Francisco State University
2007

A thesis submitted in partial fulfillment
of the requirements for the

Master of Arts in History
Department of History
College of Liberal Arts

Graduate College
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ABSTRACT

Weapons Labs and City Growth: Livermore and Albuquerque, 1945-1975

by

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This thesis traces the transformation of two cities in the American West: Albuquerque, a medium-sized metropolitan area in the generally low-population state of New Mexico, and Livermore, California, a relatively small town on the fringe of the massive San Francisco Bay Area metropolis. The federal government built nuclear weapons labs in both places after World War II, and as a result, they encountered phenomenal growth. This is not surprising, as authors such as Peter Hall and Ann Markusen have argued that federal installations in the postwar years affected the economies of many western cities. However, this thesis asserts that rural areas in the West were impacted as well. Examination of both of these cities showcases how the military-industrial complex in the postwar years affected local identities and economies. In particular, it provides case studies to better understand the issue of federal dependency in the West.

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CHAPTER 1

INTRODUCTION

This thesis traces the transformation of two cities in the American West: Albuquerque, a medium-sized metropolitan area in the generally low-population state of New Mexico, and Livermore, California, a relatively small town on the fringe of the massive San Francisco Bay Area metropolis. The federal government built nuclear weapons labs in both places after World War II, and as a result, they encountered phenomenal growth. This is not surprising, as authors such as Peter Hall and Ann Markusen have argued that federal installations in the postwar years affected the economies of many western cities. However, this thesis asserts that rural areas in the West were impacted as well. Livermore was a predominantly agricultural community until the introduction of the Lawrence Livermore Lab and Sandia California in the 1950s. And not to gloss over the rich, complex history of Albuquerque, but that city's primary industries were blue-collar prior to the federal government's establishment of the Sandia Laboratory in the middle of the twentieth century.¹

I also argue that the introductions of the Livermore Lab and Sandia were unsolicited by civic boosters, an exception to the ubiquitous scenario of promoters being

¹ The federal government itself knew early on that installations impacted their locations and sought to gain information so as to avoid past mistakes. In a mammoth study commissioned the United States Department of the Navy published in 1965, which I will quote at length due the scarcity of the volume, the author notes that "the coming of any large industrial or military installation to an area involves enormous changes for the land use, population, government, and the economy. Although it is extremely difficult to trace lines of cause and effect in the development of a community, it is possible to demonstrate the relationship between the arrival of a new large installation and some of the consequences connected with it. Almost invariably, *past examples of large installations reveal an impact of tragedy, waste, and stress and strain for the near-by population* [emphasis added]. The replication of such mistakes is inexcusable since the lessons of previous experience in impressively parallel situations are available today." However, the information that would be most helpful in the twenty first century is notably absent, and the author acknowledges this, writing, "The study makes no major attempt to deal with the withdrawal of large installations from communities and the resultant impact." Gerald Breese, et al., *The Impact of Large Installations on Nearby Areas: Accelerated Urban Growth*, (Beverly Hills: Sage Publications, Inc., 1965).

predominantly responsible for securing federal investments in western cities. Livermore does not fit this prevalent model. City leaders did not play a significant role in the installation of the weapons facilities. Yet, Livermore, an “atomic city” of the West, grew dramatically after the introduction of an unsolicited federal lab there in 1952, and was forced to adjust to the demographic, geographic, and social changes that altered the city as a result of the industry’s addition.² Albuquerque, similarly, did not lobby to acquire the Sandia Laboratory next to the existing Kirtland Field in the late-1940s.

Yet the leaders of both locales were forced to engage in big-time city building in order to accommodate a large number of newly transplanted workers. What is most interesting about this comparative study, however, is how residents in both places responded to growth in the decades following the introductions of these labs. I present Livermore as an exceptionalist case study for examining the intersection between urban development and the Cold War military-industrial complex. After the introduction of the Lawrence Livermore Lab and Sandia California, Livermore boosters could have used these new facilities to attract more industry and a larger population. However, this is not what happened. The slow-growth movement that occurred, beginning in the early 1960s, is unique, because the city’s residents reacted against unchecked growth at a time before slow-growth coalitions were prevalent in the region. In Albuquerque, by contrast, residents and city leaders embraced urban expansion, annexing land and moving to acquire additional high-tech industries for their city.

² Carl Abbott argued that postwar Western cities should be subjects of serious examination because they have become national and even international pacesetters in terms of their innovative, polycentric urban forms. He further claimed that boosterism played a distinct role in the West’s urbanization and growth, enabling (much as Gerald Nash argued) the region to shed its economic dependence on the East. The federal funds western cities received were not necessarily due to pre-existing industrial settings, but because of elbow room, proximity to engineering schools, and “vigorous local promotion.” Carl Abbott, *The Metropolitan Frontier*, (Tucson: University of Arizona Press, 1993): xii; 8.

Examination of both of these cities showcases how the military-industrial complex in the postwar years affected both rural and urban areas as well as local identities and economies. In particular, it provides case studies to better understand the issue of federal dependency in the West. While both Livermore and Albuquerque would surely sustain themselves in the twenty-first century if the labs were no longer present, mainly owing to Livermore's proximity to the San Francisco Bay Area and Albuquerque's diversified economy, the loss of these facilities would no doubt be significant. Federal reliance stemming from the twentieth century continues to play a significant role in the sustainability of both cities.

A rich social history can also be gathered from examination of the growth of the cities of Livermore and Albuquerque after the introduction of Sandia Laboratories in the postwar years, one that illustrates changing demographics of people, such as those who moved to these cities to work at the labs and reside in communities that had hitherto been largely agricultural or small-town. This subject is dynamic and often overlooked in favor of the history of the facilities themselves. In the case of Albuquerque, uncontrolled growth and an influx of a highly educated and well-paid workforce contributed directly to de facto segregation in housing and other characteristics that helped shape the modern metropolitan area. In Livermore, the city's residents wrestled with how they could preserve a small-town, rural atmosphere in their new Atomic City.³

³ Of course, many western cities during and after World War II were influenced by city lobbyists. Roger Lotchin argued that city boosters since World War I played a leading role in the development of the state. He asserted that metropolitanism is the way to understand "the New Federalism, the evolution of the military-industrial complex, the development of American military policy on the West Coast, and the growth of the Sunbelt and the distribution of resources within that region and the West," all of which could not have occurred without the aid of California boosters. In the case of Los Angeles, Lotchin asserted that the "success of [Los Angeles] came *in spite of* rather than *because of* its natural advantages," (emphasis added) and that the influence of promotion by city boosters cannot be exaggerated. For Lotchin, however, the process was destructive, in opposition to Nash's applause for the federal presence in the West after

However, it must be acknowledged that many western towns vied for industry and federal contracts over the course of the twentieth century to subsidize their economies. For example, Nevada Senator Pat McCarran lobbied strongly in 1940 for a magnesium plant south of Las Vegas, while Phoenix, Tucson, Boise, Los Angeles, and Salt Lake City also enjoyed the benefits of new defense-related facilities courtesy of the Roosevelt administration. Weapons research also boosted the economy of Las Vegas, as well as that of Alaska and the South Seas islands, where nuclear devices developed at Albuquerque and Livermore were tested. Historian Gerald Nash explained that federal defense spending favored the West during the Second World War and postwar years because of the region's isolation, ability to expand, and large amount of federal land.⁴ This thesis

World War Two. Lotchin cites boosterism as the driving force behind the militarization of California cities and comments on the drawbacks of this process. Roger W. Lotchin, *Fortress California, 1910-1961: From Warfare to Welfare*, (Urbana: University of Illinois Press, 1992): xv; 11; 69; 74; 207.

Other authors have made similar claims for other cities. For example, Len Ackland's journalistic narrative of the Rocky Flats uranium production plant in Colorado is more of a diatribe against nuclear weapons than an examination of the West as a nuclear region. However, the author does emphasize that the town would not have received the installation without the fierce lobbying of Colorado's senators. Ackland's narrative is framed by the story of one farmer who had his land at Rocky Flats seized by the government for the facility, but his study does not really examine the effects of the production plant upon either the Rocky Flats community or the larger Denver Metropolitan Area. Instead, he focuses on contamination concerns and the shady practices of the companies that ran Rocky Flats, contending that these issues, while of immense concern for the area, should be downplayed when contrasted with the broader issue of producing nuclear weapons that could destroy the world, which Ackland believes should be the ultimate concern of America's citizens.

Len Ackland *did* successfully argue that state politicians, particularly United States Senator Edwin Johnson of Colorado, elected in 1936, lobbied for installations based on the assumption that Colorado's status as a state guaranteed it rights to federal projects and dollars. Later Senator Eugene Millikin, along with "Big Ed" Johnson, brought military facilities to Colorado such as the headquarters for the North American Air Defense command (NORAD) and the U.S. Air Force Academy in the 1940s. They would also later, with the backing of local business groups, capitalize on the nation's need for uranium in the years following World War II, and obtain the Rocky Flats Plant. Boosterism certainly played a central role in Colorado's acquisition of federal facilities and dollars just as it did in Arizona, Washington, Oregon, and other states and cities examined by Gerald Nash, Carl Abbott, and Roger Lotchin. Len Ackland, *Making a Real Killing: Rocky Flats and the Nuclear West*, (Albuquerque: University of New Mexico Press, 1999): 29; 30; 39; 47.

⁴ Gerald D. Nash, *The Federal Landscape: An Economic History of the Twentieth-Century West*, Tucson: University of Arizona Press, 1999).

will examine Livermore, California and Albuquerque, New Mexico in this context. The government selected both cities because of their geography, rural location, and a combination of both isolation and relative proximity to existing airstrips and universities.

While many historians have attributed western growth to zealous boosterism in the region, this was not the case with these two cities. Albuquerque, for instance, grew into a metropolis after 1945 thanks to the Sandia Laboratory, and while this transition involved much trial and error on the parts of city leaders in the postwar years, growth and development have continued to the present. At roughly the same time, Livermore remained a small city, compared to its Bay Area neighbors, despite the arrival of the Lawrence Livermore National Laboratory (LLNL) and Sandia California. Neither Albuquerque nor Livermore or their state leaders lobbied for these facilities, but once the research labs were established, the locales' economies and social environments were dramatically altered.

As past scholarship has demonstrated, cityscapes can be completely transformed by military research, especially technologies developed during the Cold War. But not all cities competed for labs and federal spending—some just got the contracts—and other areas were simply designated as test sites, not necessarily the type of “industry” they would have sought in light of obvious human and environmental concerns. This thesis will focus on how defense spending transformed postwar Livermore, and, to a lesser extent, how residents of another “martial city,” Albuquerque, coped with hosting federal installations and how its policy responses resembled and diverged from Livermore's. The residents of the former, a rural ranch town on the northwestern border of California's Central Valley, maintained a lingering desire to remain small-sized that resulted in a slow

growth movement. In contrast, Albuquerque's government utilized the introduction of the Sandia Lab to jumpstart the local economy and move toward metropolitan status.

Examination of these locales provides an interesting glimpse into how martial cities coped with the unsolicited introduction of federal installations in the postwar years.

To go one step further, it also shows the West's continued reliance on federal dollars, a subject that has been tackled by many scholars in the past twenty years, without much consensus on how cities might move away from defense-dependent economies that were created in the twentieth century.⁵ While Livermore and Albuquerque would no doubt continue to exist if the labs shut down, this absence would certainly have negative consequences for both places. This thesis considers this possibility when examining prospects for the future and sustainability of these "atomic" cities. And despite this author's attempts to fully examine the postwar histories of these martial cities, it goes without saying that this landscape is infinitely more complicated than can be addressed within the confines of this work.

⁵ Quite a few books have examined the issue of defense-dependent urban economies in the United States, including: Sanford Gottlieb, *Defense Addiction: Can America Kick the Habit?* (Boulder, CO: Westview Press, 1997); Ismael Hossein-zadeh, *The Political Economy of U.S. Militarism* (New York: Palgrave Macmillan, 2006); Ann Markusen, et al., *The Rise of the Gunbelt: The Military Remapping of Industrial America*. (New York: Oxford University Press: 1991); Ann Markusen and Joel Yudken, *Dismantling the Cold War Economy* (USA: Basic Books, 1992); Ann Markusen and Sean Costigan, eds., *Arming the Future: A Defense Industry for the 21st Century* (New York: Council on Foreign Relations Press, 1999).

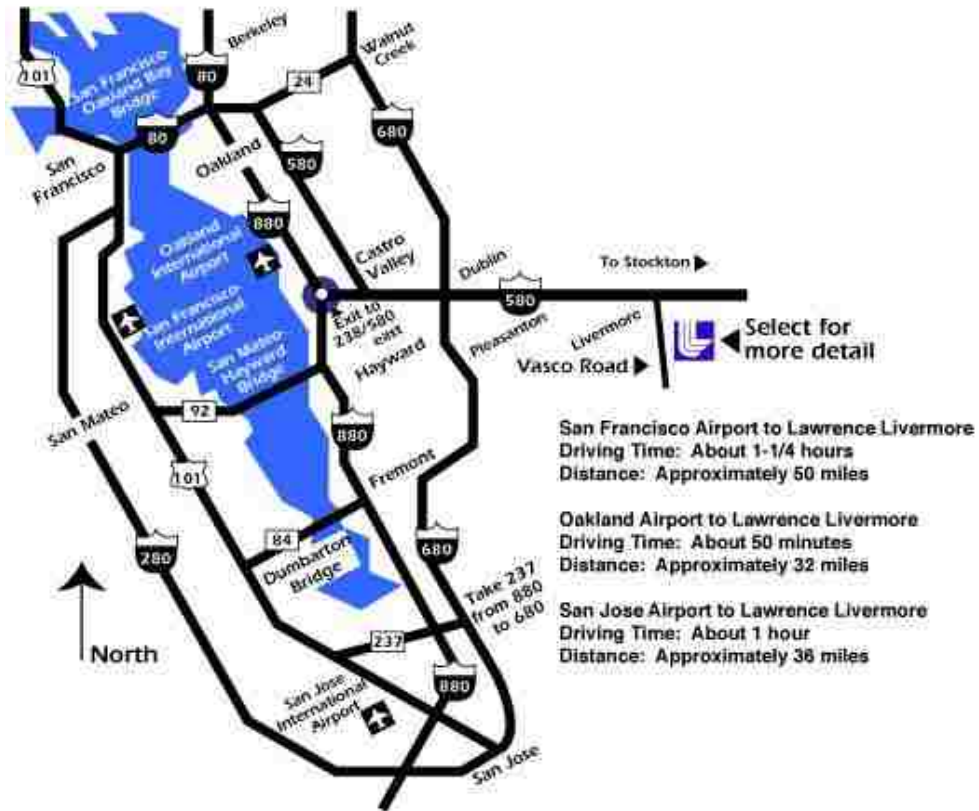


Figure 1 A visitor map indicates the location of Lawrence Livermore National Laboratory in relation to the Bay Area. While Livermore is proximate to major Bay Area airports, it is still far enough to the east to be considered somewhat remote. Provided on the Lawrence Livermore National Laboratory Web Site (lnl.gov).

However, federal aid was not always seen with its possible long-term, detrimental effects, such as dependency, in mind, because the West historically had a colonial economy that residents were anxious to sever. Western historians often cite the second quarter of the twentieth century as a time when the region jettisoned its economic vulnerability to outsiders. To be sure, the early West depended on large eastern and European financiers to develop its railroads, mines, and other infant industries. Even into the 1920s, private industry—not government—funded most research and development

efforts in the United States.⁶ Indeed, dependence on the East largely ended during the Great Depression when federal programs, especially dam construction, transformed in the West. New Dealers such as Secretary of Interior Harold Ickes wanted to diversify the region's economy, and believed that science and technology would improve society. This federal commitment to promoting science was a departure from earlier policy. With federal grants, the government hoped to boost California, in particular, by supplementing its basic industries with science and technology. Heavy World War II spending further promoted western industrialization with defense and aerospace plants in Los Angeles, Orange County, and elsewhere. After the war, the government continued to support laboratories and science facilities in the region. The idea that the West was simply switching one economic "master" for another would only become apparent in hindsight at the end of the twentieth century.

At the middle of the twentieth century, however, federal aid was welcomed and later lauded by historians, such as Gerald Nash. According to Nash, western city leaders clearly understood how military installations could boost local economies.⁷ He observed that as early as World War I, magnesite deposits in Livermore's hills were exploited for steel manufacture. A quarter century later, the federal government spent approximately \$32 million to finance construction of several facilities, including the Livermore Naval Air Station, which would eventually house the early Lawrence Livermore National Laboratory.⁸ Nash argued that the government awarded federal contracts during the

⁶ Margaret Pugh O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*, (Princeton: Princeton University Press, 2005): 19.

⁷ Nash, *The Federal Landscape*, 22; 24; 156; 39; 19-20; 50-52; 12.

⁸ Lillian Williamson Lauer, *The Community Press in Livermore, California: A Case Study*, Thesis, Journalism, (University of California, 1954): 11; 15.

Second World War particularly to those laboratories conducting research in nuclear science. While Livermore's lab would open almost a decade after the end of World War II, the impact of the city's new military ties would be enormous. The largely agricultural town became home to the nation's second nuclear weapons development laboratory. And the Cold War heightened the lab's importance for national defense, prodding both the facility and its home city to grow.

Nash insisted that the build-up of a military-industrial complex in the West was not a Congressional conspiracy against the East; it was what the West and America wanted—growth! And he placed a value judgment on this event, claiming that it was good for the region's economy. However, not all historians agree with this assessment. The postwar years were the first time the United States maintained a massive defensive force during peacetime, and some historians, such as Roger Lotchin, have contended that this commitment turned California into a state heavily dependent on federal contracts.⁹ During this time, cities certainly moved forward to assimilate returning veterans, and provide jobs, infrastructure, and diversification.¹⁰ Yet historians such as Lotchin have also questioned the federal presence in, and particular commitment to, the West. They have attributed this to the region's lack of development prior to World War II, as well as its willingness to engage in technological experimentation. This was certainly true of southern Nevada's enthusiasm for the nation's nuclear test site and the growth of

⁹ Gerald D. Nash, *The American West Transformed: The Impact of the Second World War*, (Lincoln: University of Nebraska Press, 1985): 177; 78; See Lotchin, Roger W. *Fortress California, 1910-1961: From Warfare to Welfare*. Urbana: University of Illinois Press, 1992; In this book, Lotchin presciently considered the negative implications of a defense-dependent state.

¹⁰ Abbott, *The Metropolitan Frontier*, 37.

aerospace in southern California, drawn by the area's "cheap land, mild climate, and a skilled labor force."¹¹

Carl Abbott agreed that the West got funds "not because of pre-existing industrial settings, but because of elbow room, proximity to engineering schools, and 'vigorous local promotion.'" Roger Lotchin concurred, asserting that since World War I, city boosters have played a leading role in California's development. Cities in the Golden State, he asserted, "battled for aircraft industries, flying fields, naval bases, and headquarters" and that the military-industrial complex initially impacted cities more greatly than it did industries. Indeed, with regard to the Bay Area, many cities acquired federal installations during the interwar years. The later Cold War only intensified the process.¹²

But does Livermore fit the popular model? It could hardly be considered a vital urban center in 1940. Its location was not even included in the San Francisco-Oakland Standard Metropolitan Statistical Area until 1980. While San Francisco surely influenced the postwar development of Bay Area towns, as Abbott argued, Livermore could not have kept pace with the growth of the Bay Area naturally had it not been for the arrival of Sandia and the Livermore lab.¹³ Lotchin concedes that East Bay cities "did not stand to lose or gain a great deal from the rapid metropolitan development of the state." In fact, this group of cities, which includes Livermore, feared the loss of independence in a

¹¹ Nash, *The Federal Landscape*, 88; However, historian Roger Lotchin argues that "success of Los Angeles came in spite of rather than because of its natural advantages" and that boosterism played a significant role, *Fortress California*, 69; Abbott, *The Metropolitan Frontier*, 8; Nash, *The Federal Landscape*, 99

¹² Lotchin, *Fortress California*, xv; 1; 16; 11.

¹³ Abbott, *The Metropolitan Frontier*, 7; 151.

"Greater San Francisco."¹⁴ While Livermore is indisputably part of the Bay Area's economy, and its location in this larger metropolitan area certainly cements its continued existence, Livermore's leaders did not push for development in the larger region in the postwar years. They merely sought to accommodate the growth forced upon them by the arrival of Sandia and the Livermore lab.

In his article "The Darwinian City," Lotchin clearly demonstrates that the north, south, and east bay cities competed against each other for defense projects as well as against the city of San Francisco.¹⁵ But Livermore officials played little or no role in this process. The city did not lobby the government for installations and funds. There were only a handful of boosters who promoted the place to military officials. As noted earlier, the real key to Livermore's selection as the home for a major weapons lab was its geography, relative isolation, and proximity to existing airstrips and universities. And by the 1960s, Livermore residents would react against unchecked growth, fight to maintain mid-city status, and limit growth in their hitherto agricultural land. In contrast, in Albuquerque, as will be discussed later, city boosters latched onto the potential for growth that Sandia Labs initiated, leading to the construction of a sprawling metropolis.

Using criteria provided by Ann Markusen and others in *The Rise of the Gunbelt* (1991), Livermore might be described as an "upstart military-industrial city," in which a small group established a defense facility in a relatively isolated area, as opposed to a "booster-incubated city" such as Las Vegas or an "installation-based military-industrial

¹⁴ Lotchin, *Fortress California*, 74; 43.

¹⁵ Roger Lotchin, "The Darwinian City: The Politics of Urbanization in San Francisco between the Two Wars," *Pacific Historical Review*, XLVII (1979): 357-381.

complex” like Albuquerque.¹⁶ These authors assert that despite the positive effects that federal installations bring to cities, such as jobs, income, and the possibility of spin-off industries, there are certainly deleterious trade-offs as well, such as dependency and vulnerability. The rise of federal dependence, the social implications of a nuclear weapons lab being built within a city’s limits, as well as the similarities and contrasts between the experiences of Livermore and Albuquerque, are the subjects of this paper.

¹⁶ Ann Markusen, et al, *The Rise of the Gunbelt: The Military Remapping of Industrial America*, (New York: Oxford University Press: 1991): 47-49; 232. In an interesting aside, these authors also considered whether or not the Cold War was initiated by and even prolonged by the uprising of these “Gunbelt” cities (27).

CHAPTER 2

LIVERMORE'S TRANSFORMATION

For years, the Livermore Valley was a rustic grazing area where herds eventually saw construction of a railroad in the late nineteenth century. William P. Bartlett described the area as “a gently sloping plain of irregular shape, and completely shut in by hills and mountains...hills are low, gently rolling, and well adapted for cultivation” to the north, northwest, northeast, and southwest of the valley. Bartlett credited the railroad with bringing in large population in 1871, and “towns sprung up along the line of the railroad, like magic.” He counted the population in 1878 at about 1,100 people, and claimed that the “site of the town is one of the finest to be found on the coast,” although it is, in fact, located almost 50 miles east of the Pacific Ocean.¹ Other locals also boosted the town, and civic groups sponsored local events. However, Livermore remained a hinterland to the San Francisco metropolitan area, and attracted few new residents or substantial investment in the late nineteenth century.²

The writer, Jack London, was born in San Francisco but grew up in Livermore. Local historian Janet Newton wrote that London’s family was prosperous enough to purchase a ranch there in 1883. Yet she surmised from personal writings that “Jack, having seen a vision of adventure in the waterfronts of Oakland and San Francisco, must have disliked his personal surroundings because they seemingly imprisoned him and kept him from his dream.” Perhaps she drew this conclusion from quotes of London’s such as,

¹ William P. Bartlett, *The Livermore Valley*, (Livermore: Livermore Herald Job Printing Office, 1878): 5; 11; 14.

² Douglas A. Greenberg, “Growth and Conflict at the Suburban Fringe: The Case of Livermore-Amador Valley.” Dissertation (University of California, Berkeley, 1986): 43.

“Life on a California ranch was then to me the dullest possible existence.”³ Indeed, Livermore has also been described as “hot, flat, and hardscrabble...an unpretentious mercantile center through which travelers passed on their way to somewhere else.”⁴ But many others embraced life in the countryside.

The valley became known as Livermore’s valley because of Robert Livermore who settled it in the 1830s and offered food and shelter to travelers en route to the goldfields via Altamont Pass. William Mendenhall tied the town’s future to a railroad when he donated land for a train depot in 1869. He then established the unincorporated township of Livermore by registering it in Alameda County, naming it after his good friend, the original settler. The valley’s wealth came primarily from wheat in the 1880s, before coal and oil were discovered in the surrounding hills. During the Great Depression, a gravel business sustained the town.⁵ Prior to World War II, Livermore was a small but vibrant place. In 1868 the Southern Pacific railroad was built through the valley, connecting it with the Central Valley to the east and the San Francisco Bay region to the west. From that time until the Second World War, Livermore was the principal center of trade and shipping for the farmers and other merchants in the Livermore Valley.⁶

³ Janet Newton was elected Chairman of the LHG in September of 1974 and later became the chair of the History Center. *Livermore Heritage Guild Newsletters Collection*, October 1974, The Bancroft Library, University of California, Berkeley; *Livermore Heritage Guild Newsletters Collection*; February 1982, The Bancroft Library, University of California, Berkeley. Janet Newton, Assisted by Russ Kingman, *Jack London’s Boyhood in Livermore*, (Livermore: Livermore Heritage Guild, 1980): 1; 4.

⁴ Greenberg, 69.

⁵ Livermore Heritage Guild, *Images of America: Early Livermore*, (Charleston, SC: Arcadia Publishing, 2006): 35; 7; 8.

⁶ *General Plan for Livermore, California to Guide the City’s Growth Between 1957 and 1980*, Prepared by Harold F. Wise, Associates, 546 University Avenue, Palo Alto, California, August 1957: 5.



Figure 2 Robert Livermore's "Round-the-Horn" house, pictured here in 1953, was torn down soon after this photo was taken. This landscape portrait shows the rural scenery of Livermore in the middle of the twentieth century. Courtesy Livermore Heritage Guild.

By 1940, Livermore's booster efforts had largely failed, and it remained a small town of 2,885 in Alameda County whose total county population surpassed over half a million. Livermore was overwhelmingly white (88 percent), and there were no African-Americans in that year's census. In fact, African Americans comprised only 2.1 percent of the entire county's pre-war population. Few residents over the age of 25 had completed college, and most of the population barely reached the eighth grade, well below the median number of school years completed by the county's other residents (10 for men and 10.8 for women). The largest category of employment in Livermore was craftsmen, foremen, and kindred workers; only 46 men and 69 women were employed as professional workers.⁷ But the town was slowly becoming a commuter suburb of Oakland

⁷ 16th Census of the United States: 1940. Population. *Volume II: Characteristics of the Population. Part I: US Summary and Alabama - District of Columbia*. 1943: 595; 540; 595. Craftsmen, Foremen, and Kindred Workers are defined by the Census of 1940 as blue collar workers, often working in mechanical trade positions, such as blacksmiths, forgers, and hammermen, to name only a few of the occupations listed within the category.

and other factory towns. As early as 1940, Livermore estates were being sold to make way for development of smaller homes on the sites.⁸ More disruptive changes would occur during the next decade.

Before World War II, the town largely depended on horse ranches and vineyards.⁹ That way of life did not end abruptly when federal installations began to be constructed, although the population increased dramatically, featuring a young and educated workforce. The first federal facility in Livermore was not a research laboratory. During World War II, the navy needed a land base where planes assigned to aircraft carriers moored in San Francisco Bay could be housed temporarily for maintenance and training. The US Livermore Naval Air Station opened in 1942, four miles east of the little town, and trained over 4,000 pilots in the skies over northern California. As the war progressed, the navy needed less pilots and the air station became more of a base to house fighters. It was quickly deactivated after V-J Day. In 1946, it was officially closed, and the navy announced that the property would be available for public use.

A year later, the Alameda County Board of Supervisors voted to take over the site, and negotiated a lease agreement of \$1 a year. When Livermore schools opened in the fall of 1948, some of the former Navy buildings were used to ease classroom overcrowding until the Junction Avenue School was completed. Then, the county cancelled its lease on the old base in late March 1950 when the Atomic Energy Commission (AEC) announced a contract with California Research and Development Company to construct an atomic

⁸ "Livermore Estate Sold to Builders," *New York Times*, August 2, 1940; "Residences Figure in West Side Deals," *New York Times*, April 3, 1943.

⁹ Hugh Gusterson, *Nuclear Rites: A Weapons Laboratory at the End of the Cold War*, (Berkeley: University of California Press, 1998): 15.

particle accelerator on the location. Almost three years later, the AEC chose the former naval station as the nation's second nuclear weapons design laboratory.¹⁰ The Lawrence Livermore National Laboratory opened in 1952. Livermore would soon claim the second highest proportion of PhDs per capita of any community in the country (only behind Los Alamos)—an unlikely honor for the former agricultural town.¹¹

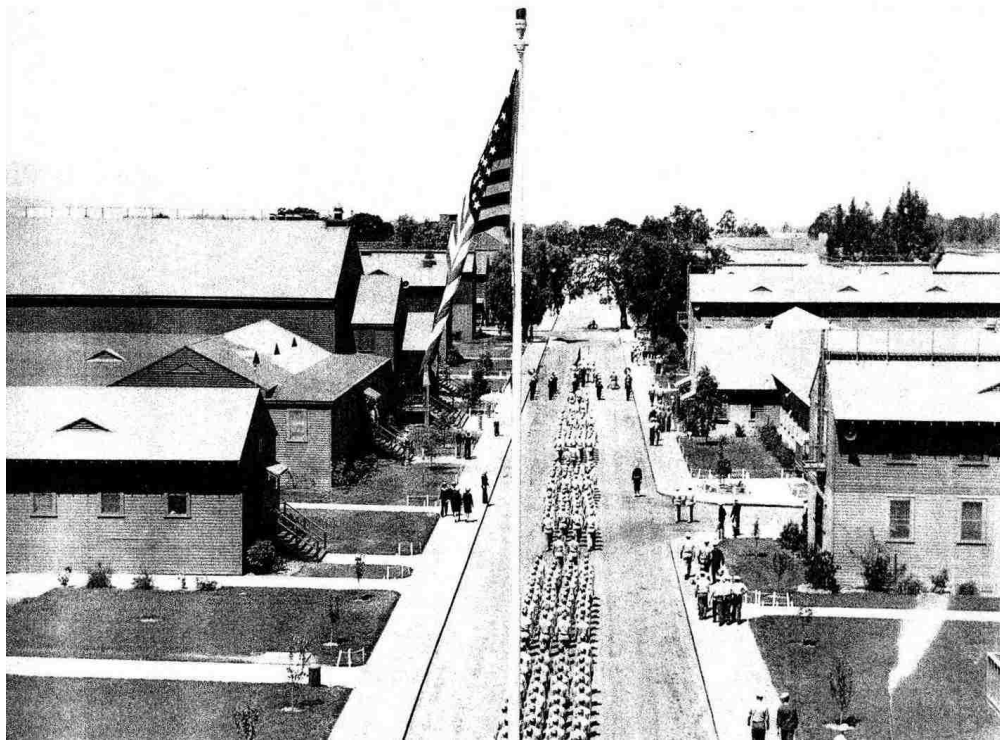


Figure 3 The Livermore Naval Air Station, pictured here in 1943, was the city's first federal installation. However, it was deactivated almost immediately after the end of the Second World War. Courtesy Livermore Heritage Guild.

War Changes Livermore

Bureaucratized science in the postwar years allowed scientists to exert their influence outside the laboratory to affect policy-making and city-building. Vannevar

¹⁰ Gary Drummond, city historian, unpublished materials, Livermore Heritage Guild.

¹¹ Gusterson, *Nuclear Rites*, 17.

Bush, ex-vice-president and dean of engineering at MIT (1932–38) and director of the Office of Scientific and Research Development (OSRD) from 1941-1943, believed that engineers had a responsibility to affect policy-making, whether it be national or local. Large-scale government-sponsored research and development occurred as never before, beginning with the Manhattan Project. Such ambitions demanded specialized cities to house federally funded weapons laboratories, such as those found in Albuquerque and Livermore. After the war, the Truman Administration advocated the policy of dispersal—the idea that suburbs were the ideal locales to conduct weapons research so as not to make them obvious targets for a possible Soviet attack.¹² Were the locations of laboratories in Livermore byproducts of this new idea of government-encouraged dispersion? This is a possibility; considering the city’s continued small size and the relative lack of promotional sources, there was no driving force in the city pushing it to acquire new industries in the 1950s.

Even though Livermore, unlike any city in New Mexico, is close to both a major metropolitan area as well as a national coastline, the Livermore Lab’s location was probably chosen for the same reasons that Lieutenant General Leslie R. Groves and J. Robert Oppenheimer chose Los Alamos for the Manhattan Engineering District: it was isolated yet accessible.¹³ Isolation was crucial for security and safety reasons. Edward Teller proposed that nuclear reactors should be built in out of the way places as a preventative measure against the possibility of them exploding, even though their distant

¹² Margaret Pugh O’Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*, (Princeton: Princeton University Press, 2005): 22; 26; 29.

¹³ Carl Abbott, *The Metropolitan Frontier*, (Tucson: University of Arizona Press, 1993): 21.

location might hinder their usefulness.¹⁴ So the California location was chosen. And while boosters did not lobby for them, the laboratories built in the 1950s sustained Livermore's economy for the next half century, and most residents have been satisfied not to push for more growth or economic diversification. Even so, growth was the source of a contentious debate that began in the 1960s and will be covered in a later chapter.

The decision to build the Livermore Lab was made without much fanfare, because the implications of the project were not well-publicized. A March 1950 press release from the University of California Office of Public Information simply announced that a "new classified research project is being undertaken in the San Francisco Bay Area." This involved the construction of a new particle accelerator to be undertaken at the previous site of the Livermore Naval Air Station. The United States Navy negotiated the transfer of this property to the Atomic Energy Commission, and the University of California Radiation Laboratory at Berkeley agreed to provide expertise on the project.¹⁵ The "Rad Lab," as the UCRL was informally called, was initially created as a branch of the department of physics at the University of California, Berkeley in 1936 under the direction of Professor Ernest Lawrence, developer of the cyclotron. The Berkeley lab had expanded since the war with a continuing research emphasis in nuclear physics. The plan for the UCRL branch at Livermore was that it would focus on "design and development of nuclear and thermonuclear weapons; studies in the field of nuclear propulsion; and exploration of methods for producing a controlled thermonuclear reaction." By 1957, the

¹⁴ Edward Teller, "The Safety of Nuclear Reactors," 058---, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

¹⁵ University of California Office of Public Information, Press Release for release in morning newspapers Friday, March 31, 1950, 068---, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

Livermore branch employed 2,500 personnel in 80 buildings on a 600-acre site.¹⁶ The influx of newcomers would alter Livermore's landscape, although natives would fight to retain their agricultural roots in years following the introduction of the lab.



Figure 4 This photo shows the city of Livermore in the 1920s, facing East. The prominent road heading further east, parallel to the train track to its left, is East Avenue, which would eventually lead to the Labs. Courtesy Livermore Heritage Guild.

While investigating American military aims, spending, and environmental impacts in the Pacific and Far West in *Pathways to the Present*, historian Mansel Blackford noted that while Pentagon officials and local residents initially viewed both Seattle and Silicon Valley as “lush and fertile and attractive,” they soon became over-urbanized like most metropolitan regions of the West. In contrast, Livermore remained largely isolated and free from urban congestion at the easternmost limits of the San

¹⁶ “A History of the University of California Radiation Laboratory,” 5-21-57, 068712-068714, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

Francisco Bay, with only Altamont Pass separating the city from Tracy and the San Joaquin Valley. Despite this relative seclusion, it can be assumed that the labs in Livermore garnered a fair share of the \$13 billion in prime defense contracts that California received between 1951 and 1953.¹⁷ And Livermore residents seemed determined that their city would not lose its picturesque qualities, learning from the experiences other martial cities in the West. Indeed, they had the advantage of living in the place where the most recently constructed weapons lab was located, and were at luxury to consider how the introduction of facilities had already changed other western cities.

Three laboratories have been involved in America's nuclear weapons design program: Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL). LANL and LLNL designed the explosives, while Sandia designed the rest of the nuclear bomb or warhead, such as the fuzing and firing systems.¹⁸ Today, the Lawrence Livermore National Laboratory and Sandia California sit together on the east edge of town. Behind the laboratories today stand only the hills of the countryside, reflecting the fact that much of the land to the east of these facilities continues to be held by the Department of Energy, the successor of the Atomic Energy Commission. Although 1950s Livermore quickly became a laboratory town, residents stubbornly clung to their "cowpoke" values into the twenty-first century, as this paper will demonstrate.

¹⁷ Mansel G. Blackford, *Pathways to the Present: U.S. Development and Its Consequences in the Pacific*, (Honolulu: University of Hawai'i Press, 2007): 63; 67.

¹⁸ Leland Johnson, *Sandia National Laboratories: A History of Exceptional Service in the National Interest*, (Albuquerque: Sandia National Laboratories. 1997): 3.



Figure 5 Lawrence Livermore National Laboratory appears to exist in bucolic bliss with the Central Valley hills in the background. Provided on the Lawrence Livermore National Laboratory Web Site (llnl.gov).

Origins of the Lab

Several years after Edward Teller left Los Alamos in 1945 for a research position at the University of Chicago, Norris Bradbury, longtime Director of the University of California's Los Alamos Scientific Laboratory, convinced him to return to Los Alamos to work on the hydrogen "fusion" bomb. There, Teller devoted his time to developing a "Super," even though he did not think that there was sufficient computing power available at Los Alamos to perform the necessary theoretical calculations. By 1949, as the Cold War intensified and Josef Stalin's scientists developed an atomic bomb, Teller became convinced that development of a "Super" hydrogen fusion bomb was crucial and urged the lab to focus on its development.

Following the Communist takeover in China and the outbreak of the Korean War, President Truman in 1950 ordered development of a hydrogen bomb, and directed the AEC to continue its work on all types of nuclear weapons. Meanwhile, Teller struggled to recruit bright, new talent for the Los Alamos team. This was partly because many of the scientists who had worked on the atomic bomb, like J. Robert Oppenheimer, found their work morally irresponsible in hindsight. Nevertheless, Teller pushed ahead with development of the bomb at Los Alamos. Together with Stanislaw Ulam, he figured out

theoretically how to build the bomb by 1951. Soon after, Teller told supporters that he would remain on at Los Alamos only if he were appointed to head the thermonuclear program. But Bradbury assigned Marshall Holloway to the coveted position, and Teller resigned in a fury.

Teller, frustrated by the seeming lack of support for thermonuclear development and deprived of what he considered his rightful position as head of that division at Los Alamos National Laboratory, pushed for a second weapons laboratory that would focus solely on work related to the hydrogen bomb. According to some accounts, he had been lobbying since 1947 for the development of a second institution dedicated solely to thermonuclear research.¹⁹ Ernest O. Lawrence proposed an adjunct branch in the Bay Area. Thanks to Teller's fierce lobbying of both the Atomic Energy Commission and the newly created Air Force, the federal government erected the Lawrence Livermore Laboratory at the city's former naval air station. It was relatively close to Berkeley and easily overseen by the University of California.²⁰ The connection between the university and lab would remain strong until student protests in the 1960s and 1970s pressured the school to sever its association with Livermore and give this relationship a lower profile.

¹⁹ Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, (New York: Touchstone, 1995): 355; 383; 390; 407; 417; 470; 478; 460; Even though the Teller-Ulam configuration was a joint effort, Teller was aghast at sharing credit for what had grown into his *raison d'être*. For a detailed account of both American and Soviet efforts at hydrogen bomb development, see the book in this citation.

²⁰ The University of California Radiation Laboratory is currently named the Ernest Orlando Lawrence Berkeley National Laboratory, but UCRL will be used in this paper to avoid confusion. See Barton Hacker, "A Short History of the Laboratory at Livermore," *Science & Technology Review*, Regents of the University of California, (September 2008): 13; Gusterson, *Nuclear Rites*, 21; 22.



Figure 6 The University of California Radiation Laboratory at Livermore in the 1950s was a rather small-time operation. Residents may not have guessed that the UCRL's later incarnation, the Livermore Lab, would become the town's economic mainstay. Courtesy Livermore Heritage Guild.

Livermore was not the immediate choice for the new lab. Wallace B. Reynolds is generally credited with establishing the Livermore Lab. He was the Business Manager and Managing Engineer at the Radiation Laboratory at the University of California (1949-1952) and then held the same title at the University of California Radiation Laboratory at Berkeley and Livermore. Regarding the location for the lab's site, he later recalled that "We (Ernest Lawrence and himself) went around to visit sites. We went up by Fairfield and looked out there by Concord, but ruled that out, too small. Finally, of

course, it [the Materials Testing Accelerator (MTA)] ended up out at Livermore.”²¹

Herbert F. York, the first director of LLNL from 1952-1958, recalled that “Lawrence was one of the people most concerned about what was happening in the world. He was seriously worried about the way that Cold War might move. And, so, he was looking for some way to make a contribution to the national security that was analogous to what he had done during World War II” (when he “fathered” the cyclotron at UCRL). The new lab at Livermore was his solution.

York noted that the research area in Livermore was called the MTA project at times and the California Research Corporation at others, before it permanently became the Livermore Lab. He also remembered that “What I call the Livermore Laboratory and the CRC group occupied the site together for more than a year. I don’t remember exactly the length of time, but for a substantial time. And during the first months of the Livermore Laboratory, the California Research Corporation provided the housekeeping, including the guards.” He recalled the origins of Livermore Lab: “We (Duane Sewell and himself) started Livermore...we designed two buildings. One of them was sort of a shop building, but a rather special one for building hydrogen bombs, that could handle the kinds of technology—uranium, lithium, and so on.” But there was difficulty in convincing people to work there in the beginning, because “At Livermore we were very much aware of the difficulty of recruiting people to do that sort of work, partly because it was applied. People would rather be doing things that were pure because they’re unclassified. But partly because there was always a question in the minds of people about

²¹ *Wallace B. Reynolds: Laboratory Management at Berkeley and Livermore*, An Interview Conducted by Graham Hale, Recorded December 12, 1975 and February 19, 1976, University of California, Berkeley History of Science and Technology Program, Copyright 1982 by The Regents of the University of California: 70; Note that when cheaper sources of uranium were found, the MTA project was abandoned.

the necessity of doing work on nuclear weapons.”²² In 1954, J. H. Belknap at Livermore Lab wrote a memorandum to Lawrence about the possibility of offering graduate education for Livermore employees, because “we could attract stronger junior people, and could possibly hold for a longer continuing service those who are on the payroll and who wish to advance themselves to high academic levels.”²³ It is unclear whether Lawrence heeded this advice, but this memo demonstrates the difficulty recruiting skilled employees at Livermore Lab in its early years.

Fortunately, there are some oral histories that shed light on the problem. Joseph Behne, one-time Test Director at the Lawrence Livermore National Laboratory, explained why he chose to work in Livermore: “To make a long story short, Los Alamos at that time was still a government town. You could not own a private home at Los Alamos at that time. It was all government housing. And Livermore wasn’t. Livermore was a civilian town. And what I wanted to do was to build a house. I wanted to do it myself, and I could do that in Livermore and I couldn’t do it in Los Alamos. That was probably the main reason that I decided to take the job in California instead of New Mexico.”²⁴ Thus, the facility’s location attracted some employees, especially if they could find a home in Livermore despite the housing shortage.

²² *Herbert F. York: Physics at Berkeley and Livermore, 1943-1952*, An Interview Conducted by Arthur Lawrence Norberg, Recorded September 9, 1975 and May 13, 1976, University of California, Berkeley History of Science and Technology Program, Copyright 1982 by The Regents of the University of California: 61; 75; 76; 85; 71. York later recalled his participation in the nuclear arms race with great lament and anxiety for the future in *Race to Oblivion: A Participant’s View of the Arms Race*, (New York: Simon and Schuster, 1970).

²³ Memorandum from J. H. Belknap to Prof. E. O. Lawrence regarding Graduate Program at Livermore, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

²⁴ *Interview with Joseph Behne*, Conducted by Joan Leavitt, July 22, 2004, Nevada Test Site Oral History Project. University of Las Vegas, Nevada. 2007: 6.

Meanwhile, Lawrence was consumed with the logistics of setting up the lab. He was the overall director for the main laboratory in Berkeley, and York was the on-site director at Livermore Lab. The latter remained subservient to the UCRL and, at first, the federal government did not believe that the Lab had completed enough significant projects to be in competition with Los Alamos. While the Livermore Lab investigated controlled fusion in the early 1950s, weapons research was the primary objective of the institution. However, AEC officials considered it a “relatively marginal player,” and the Lab had to prove its worth well into the 1960s.²⁵ Its directors often found themselves frustrated, rather than invigorated, by competition with Los Alamos. When Teller became Associate Director at Livermore in 1953, he was not overly enthusiastic about the work he had hoped to accomplish there, even though the Lab’s new mission was thermonuclear diagnostic studies.²⁶ Teller thought that the Atomic Energy Commission’s plans were too vague, and considered his Livermore appointment to be at the *lesser of two inferior* institutions.²⁷

As much as the lab’s sudden arrival surprised local residents, its presence also unsettled many scientists like Teller and even severed long-time friendships. As Wallace Reynolds recalled, “I became convinced that Edward was a frustrated man. He wasn’t able to get anything done through Los Alamos” during the time of hydrogen bomb development.²⁸ In later years, the *Washington Post* reported that there was a long-

²⁵ Barton Hacker, “A Short History of the Laboratory at Livermore,” *Science & Technology Review*, Regents of the University of California, (September 2008): 14; 15.

²⁶ Teller would later become the Director of the Livermore Lab from 1958-1960.

²⁷ Rhodes, *Dark Sun*, 496.

²⁸ *Wallace B. Reynolds: Laboratory Management at Berkeley and Livermore*, An Interview Conducted by Graham Hale, Recorded December 12, 1975 and February 19, 1976, University of

standing rivalry between Los Alamos Scientific Laboratory and Livermore Laboratory. He claimed that that in 1954 “an already strained relationship between the two laboratories grew acrimonious when Teller testified against J. Robert Oppenheimer, former Los Alamos director, at hearings before the Atomic Energy Commission,” during which Oppenheimer was accused, among other things, of being sympathetic to communists because he did not unconditionally support development of a hydrogen bomb. “All participants,” the reporter declared, “know that Livermore was born in 1952 at Teller’s insistence to battle Los Alamos as it was being run by Oppenheimer’s chosen successor, Dr. Norris Bradbury.”²⁹ Exaggerated or not, the media seized on the competition and it garnered headlines nationwide.

Teller’s ruthless promotion of *his* lab knew no bounds. For example, a 1950 newspaper article questioned Bradbury about the charges brought against Los Alamos that it had been “dragging its feet” on thermonuclear research, charges that were mainly attributed to Teller. Bradbury defended his Laboratory, insisting that “We were engaged in the design of a thermonuclear experiment before the Russian bomb in 1949... [and] Los Alamos has always been in a crash program. The word crash means merely everybody works just as hard as he can. This we have been doing since 1943.”³⁰ Two years later, the *Livermore News* credited Edward Teller, while working at the University of California Radiation Laboratory, with the fabrication of a device demonstrating the

California, Berkeley History of Science and Technology Program, Copyright 1982 by The Regents of the University of California: 76

²⁹ Walter Pincus, “2 Labs Battle to Be No. 1,” *Washington Post*, December 12, 1978.

³⁰ “Livermore Vs. Los Alamos Lab,” Unknown newspaper clipping, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

feasibility of a fusion bomb.³¹ Bradbury held a press conference at his Los Alamos office in September 1954, at which he defended the LANL against further accusations that his lab had not devoted enough energy to thermonuclear research. He asserted that Los Alamos had never stopped development in this field and that the “imputation of disloyalty” was a “tragic, if not malevolent, thing.”³² He had reason to be upset. Indeed, the hydrogen bomb was eventually designed at Los Alamos.

The *Washington Post and Times Herald* in October 1954 reported that Teller’s hydrogen bomb, designed at the UCRL, was a failure and that it was the Los Alamos weapon that really worked. However, Teller has been credited continually with developing the hydrogen bomb, a fact which Los Alamos would still like to see corrected.³³ But due to the classified nature of this research, no one other than the participants will ever know the truth. However, when Los Alamos National Laboratory was the first to detonate a thermonuclear device at Eniwetok Atoll, Teller was not in attendance. According to historian Richard Rhodes, he monitored a seismograph in Livermore with Ernest Lawrence and Luis Alvarez.³⁴ President Eisenhower officially confirmed the detonation of a hydrogen bomb at Eniwetok to Congress in 1952, “which

³¹ “H-Bomb Was Developed Here Fortune Says,” *Livermore News*. Monday, May 18, 1953.

³² Statement made by Norris E. Bradbury, Director of the University of California’s Los Alamos Scientific Laboratory, at the beginning of a press conference held in his office at 9:15 a.m., MDT, on Friday, September 24, 1954, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

³³ Joseph and Stewart Alsop, “Teller’s H-Bomb Is Called a Dud,” *Washington Post and Times Herald*, October 4, 1954.

³⁴ Rhodes, *Dark Sun*, 511.

wiped out an island...leading to the dread hydrogen bomb.”³⁵ Soon after, due to the fact that the Joint Committee on Atomic Energy (JCAE) had more clout than the Atomic Energy Commission (AEC) in the early 1950s (because its staff was ripe with experienced scientists), the JCAE successfully pushed for development of the hydrogen bomb and for stockpiling an arsenal of them. A significant number of weapons already existed by 1954.³⁶ Many research facilities contributed to these new technologies in weapons research and development in the early Cold War, but the task of building and housing both atomic and nuclear bombs fell to the Sandia Corporation, which had sprouted from a division of Los Alamos in the postwar years.

Sandia began to influence Livermore’s development when it opened alongside the Lawrence Livermore Lab in 1956. Wallace Reynolds recalled that “I actually thought that Sandia should have had competition. Maybe the country would have been better off at one stage of the game having competition.” Eventually, officials created a branch lab at Livermore, because it was difficult to trade information quickly over long distances. One prime example that Reynolds noted was the building of submarine missiles, which involved “military people, Laboratory people and the Sandia group....To make the warhead, you had to trade off such that you keep the center of gravity right.”³⁷ Sandia had earlier provided engineering assistance to Los Alamos Laboratory’s main competitor, the University of California Radiation Laboratory in Livermore (UCRL), beginning in 1953

³⁵ “Ike Confirms 1952 H-Blast in Pacific” and “New Atomic Tests Begin in Pacific,” Unknown newspaper clippings, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

³⁶ Roger W. Lotchin, *Fortress California, 1910-1961: From Warfare to Welfare*, (Urbana: University of Illinois Press, 1992): 271; 273.

³⁷ *Wallace B. Reynolds: Laboratory Management at Berkeley and Livermore*, An Interview Conducted by Graham Hale, 78.

when Teller became the associate director. This was a first step toward Sandia providing ordnance support for the laboratory in California.³⁸

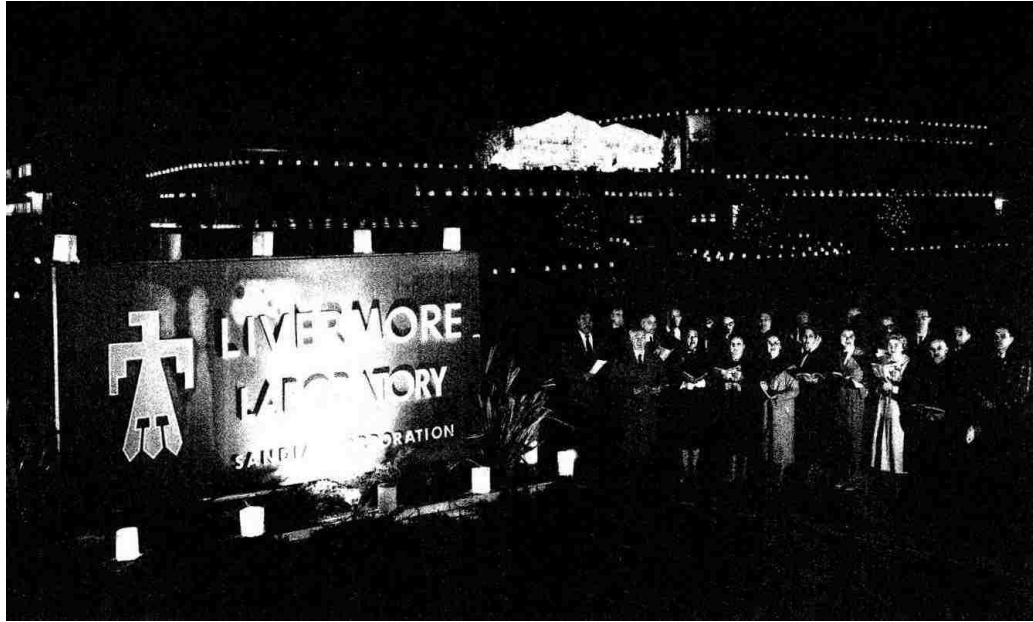


Figure 7 A somewhat somber promotional photo of the Sandia California facility and staff was taken in the late-1950s. Perhaps Sandia did not need to project a friendly image to the city of Livermore—Sandia would be there whether residents liked it or not. Courtesy Livermore Heritage Guild.

Sandia came to Livermore because the University of California Radiation Laboratory needed an engineering organization close by and because coordination between UCRL and Sandia from Albuquerque had been inefficient, which ultimately forced the company to open a work site in Livermore. Sandia historian Necah Stewart Furman reported that “In March 1956, Sandia Corporation formally established a second weapons laboratory with headquarters in an old WAVE’s barracks building across the street from UCRL in Livermore.” In the beginning, there was only one department at Sandia in Livermore—Engineering. Ernest Lawrence’s ties to Sandia went back at least to 1942 when he first met Robert W. Henderson, later the first Executive Vice-President

³⁸ Necah Stewart Furman, *Sandia National Laboratories: The Postwar Decades*, (Albuquerque: University of New Mexico Press, 1990): 646.

of weapons for Sandia National Laboratories.³⁹ It seemed natural for Sandia to support the Livermore Lab. Local media in Livermore applauded the move. In March 1956, *The Livermore Herald* announced in that the new ordnance engineering function would be carried out by Sandia Corporation of Albuquerque, and would employ 800 to 1,000 persons by July 1958. An article predicted that most engineers and draftsmen would be transferred from Albuquerque and many others would be recruited from the Bay Area.⁴⁰ While a small group of Sandia employees were transferred to Livermore in 1955 to assist the Lawrence Livermore Lab, this number had been insufficient. R. W. Henderson, director of systems development for Sandia Corporation in Albuquerque, told the *Herald* in June 1956 that Sandia would expand in Livermore, examine the branch's currently shared facilities with the UCRL, and discuss Sandia's responsibilities in Livermore for the "foreseeable future."⁴¹

Almost immediately, Sandia administrators and the AEC planned to increase the workforce to 1,000 at Livermore and invest \$5 million in construction of facilities, because early projects such as building the W38 warhead for Titan missiles, the B41 bomb for the Strategic Air Command, and the W47 warhead for the Polaris submarine required a larger facility. Sandia California did expand its staff, but the employee roster remained stable at around 1,000.⁴² However, Cold War events catalyzed the process. Following the launch of Sputnik and the Soviet Union's successful test of an ICBM in

³⁹ Furman, *Sandia National Laboratories*, 679; 74.

⁴⁰ "Sandia Corp. Plans New Lab," *The Livermore Herald*, March 9, 1956.

⁴¹ "Sandia Official Describes Work of Livermore Lab," *The Livermore Herald*, June 1, 1956.

⁴² Johnson, *Sandia National Laboratories*, 71; 72; "Sandia California" has been employed as an alternative to Sandia National Laboratory in Livermore by Sandia historian Leland Johnson.

1957, the AEC secured over \$3 million to construct five new Sandia Corporation buildings at the site. The *Livermore News* never commented on how this growth would affect the city, but noted that the construction would be overseen by architects and engineers from San Francisco.⁴³ Lab press releases played down the potentially controversial nature of weapons research to the public, couching it in terms of national defense. In a May 23, 1957 speech, W. J. Howard, Director of Systems Development at Livermore, said that “it is the job of Sandia to develop weapons, not to wage war, but to prevent war.”⁴⁴ This echoed the beliefs of a minority of the “original” Los Alamos scientists, led by Edward Teller, but would not include the views of J. Robert Oppenheimer, I. I. Rabi, James Conant, and other noted scientists.

Further enhancing the image of the new nuclear city, *The Livermore News* reported in June 1955 that the AEC sought to acquire 4,000 acres of hilly grazing land near the municipality for testing non-nuclear explosives to cut costs for transporting materials from Livermore to Nevada’s Test Site. The Kelly family, to whom 3,000 acres of this land belonged, negotiated a deal with the AEC. The site later became known as Site 300.⁴⁵ Meanwhile, the Livermore Lab continued to grow. A newspaper column in March 1956 reported that the workforce would be expanded from the current 1,800 to more than 2,800 employees over the next two years to more rapidly develop H-bomb warheads and ICBMs.⁴⁶ But, on the horizon loomed a possible testing moratorium that

⁴³ “\$3,197,470 Contract For Five AEC-Sandia Buildings Awarded; Construction Will Start Soon,” *The Livermore News*, October 29, 1957.

⁴⁴ Furman, *Sandia National Laboratories*, 629.

⁴⁵ “AEC Negotiates for 4,000 Acres to Test Explosives,” *The Livermore News*, June 23, 1955.

⁴⁶ “H-Lab at Livermore Due for Expansion,” *Washington Post and Times Herald*, March 9, 1956; The Lab grew quickly, both in employee count and annual budget from 1953 to 1963. While this trend did

threatened to halt development at weapons labs nationwide. Personnel at Livermore, including now Director Edward Teller, were particularly concerned.

Supporting this concern was a *San Francisco Examiner* editorial published in May 1958 touting the benefits of nuclear weapons testing in the Pacific. Pushed by the Soviet Prime Minister Nikita Khrushchev, test ban negotiations were already ongoing between the United States, Great Britain, and Soviet Union, but the unknown author of the editorial argued vehemently for the continuation of nuclear testing. He portrayed the tests as a deterrent to nuclear war, and argued that the “Russians are striving desperately to stop [testing], in their own unholy interest.” Ernest Lawrence recognized the author and, a few days later, sent a four-sentence message to E. D. Coblentz, commending him for his editorial and for reiterating what “needs saying over and over again.” The UCRL obviously opposed the possibility of a testing moratorium.⁴⁷ Two months later, AEC Commissioner Willard F. Libby and Livermore Director Edward Teller sent a confidential message during the Geneva test ban negotiations urging the U.S. to agree to nothing more than a limit on offsite fission fallout. This would allow the nation to continue testing weapons under the guise of investigating the peaceful uses of nuclear energy.⁴⁸ This tactic, however, was transparent and failed to sway national leaders.

not remain consistent throughout the 1970s, by 1987, the Reagan Administration's defense programs boosted the number of employees at LLNL to 8,000 and expanded the budget to \$1 billion. The buildings and equipment at Lawrence Livermore National Laboratory in 1990 were valued at \$4 billion, Gusterson, *Nuclear Rites*, 25.

⁴⁷ “The Pacific Tests,” *San Francisco Examiner*, Thursday, May 1, 1958, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.; Typed note from Ernest O. Lawrence to Mr. E. D. Coblentz, May 5, 1958. Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

⁴⁸ Teletype Message to John McCone from AEC Commissioner Willard F. Libby and Dr. Edward Teller, Director of the Livermore Research Laboratory, A Limited Test Moratorium, Declassified Documents Reference System. Issue Date July 25, 1958. Declassified: November 06, 1995.

Ultimately, the moratorium went into effect in 1958, although weapons design continued at the nation's labs until testing resumed in 1961. However, neither Livermore nor Albuquerque was noticeably affected by the moratorium or even by the atmospheric test ban treaty of 1963. Diversification of projects at both labs kept operations running.



Figure 8 An aerial view of Sandia National Laboratory in Livermore shows an expansive facility built on a previously agricultural landscape. Provided on the Sandia Corporation Web Site (sandia.gov).

Social Landscape of Livermore in the 1950s

Sandia's facilities and the growing Livermore Lab transformed the little town of the 1940s. In March 1950, *The Livermore Herald* announced that the AEC would build an atomic research project in Livermore at the old Naval Air Station, staffed by 150-200 employees. "No housing will be erected on the grounds," the column reported. "Staff members will reside in town or elsewhere in the community."⁴⁹ Residents did not seem to realize that Livermore would never again be the same. City and business leaders voiced few concerns about the growth problems this might entail. Perhaps their view was not entirely naïve. The existence of the nuclear weapons lab at Livermore was not officially confirmed by the AEC until January of 1954. Perhaps not to worry residents and

⁴⁹ "\$7,000,000 Atomic Research Project Coming Here: We Be Located At Former Livermore Naval Air Station, Construction Soon," *The Livermore Herald*, March 31, 1950.

onlookers, the AEC did not specifically designate Livermore Lab an “H-bomb laboratory,” but instead broadly referred to it as a “weapons” research lab.⁵⁰ Apparently, few residents thought the laboratory would change the town’s rural quality of life which had persisted for so many decades.

But they were wrong. By 1950, even before ground was broken for the lab, the local population had increased over 50 percent from the previous decade thanks to the naval bases (from 2,885 to 4,364). Yet, owing to its small size, relative to other Bay Area cities, little statistical data for Livermore is available from that year’s census. It is clear that the city’s demographics had remained largely unchanged since 1940. But the number of people with a bachelor’s degree grew with the population, and the median number of school years completed by students rose to 10.6 years, compared with a junior high school education being the norm just ten years earlier. The largest group of employed men (268) worked as craftsmen, foremen, and kindred workers, the same primary occupation as in 1940. Service work (not in a private household) was the leading job for employed women. Most of the population consisted of native white men and women; as in 1940, there were still no African American residents.⁵¹

	1940	1950
Population	2885	4364
Median Number of School Years Completed	7-8	10.6
Largest Occupation	Craftsmen	Craftsmen

Table 1 From 1940 to 1950, the population of Livermore grew and the level of education among residents increased. However, the main characteristics of citizens, such as prevalent occupations, remained largely the same.

⁵⁰ “Secret H-Bomb Lab Revealed at Livermore,” *Los Angeles Times*, January 31, 1954.

⁵¹ 1950 Census of Population. *Volume II. Characteristics of the Population. Part 5. California: 5-54; 5-136; 5-144; 5-136*; A total of 163 women were employed in Livermore in 1950.

Gerald Nash has asserted that increased diversity in western cities during World War II allowed the region to mature.⁵² Perhaps Livermore's lack of diversity and relatively small size explains why it did not take up twentieth-century conveniences and industries as quickly as larger metropolitan areas on the coast. Part of the problem was the speed with which sophisticated weapons labs were thrust upon the longtime rural place. In their insightful 1959 story on Livermore and the lab, *New York Times* reporters Grace and Fred Hechinger explained that scientists were "dumped by the University of California and the AEC" into a "hot and unspectacular town" to conduct supersecret research.⁵³ Livermore's quaint rural culture was treated condescendingly by cultured observers and visitors as well as by lab employees. At the same time, the town itself was gaining more self-awareness, at least in so much as residents knew they were being judged by outsiders. In 1952, "Atomic Street" in Livermore changed its name to "Estate Street," and while no reasons for the change were given, one might assume that it was to distance the city's street names from the stigma of its quickly expanding, proximate nuclear weapons laboratory.⁵⁴ Yet Livermore would embrace itself as an Atomic City in later years.

Meanwhile, following the Korean truce, President Eisenhower and Secretary of State John Foster Dulles articulated their view that the nuclear deterrent was the preferred Cold War approach to countering growing Soviet threats. As a result, more funding flowed into the nation's weapons labs. In 1954, the San Francisco Field Office of the

⁵² Gerald Nash, *The American West Transformed: The Impact of the Second World War*, (Lincoln: University of Nebraska Press, 1985): 205.

⁵³ Grace and Fred M. Hechinger, "X-Ray of the Scientific Mind," *New York Times*, October 18, 1959.

⁵⁴ "Atomic Street Now Changes to 'Estate,'" *The Livermore News*, January 10, 1952.

AEC thought it necessary to issue a press release explaining its activities in the Bay Area. The Office noted that the establishment of a weapons research laboratory in Livermore in 1952 served the purpose of augmenting research that had been the sole domain of the Los Alamos and Sandia laboratories.⁵⁵ There was also a simultaneous effort to keep these activities more secret. Indeed, department heads at the Berkeley Radiation Laboratory received a memorandum ordering them to restrict discussion of work done at the Lab to the limits of the announcement.⁵⁶ Thanks to the Eisenhower Administration's generous funding, the labs continued to grow. In 1955, the AEC justified increasing personnel at the Radiation Laboratory to better utilize the Bevatron and providing "sufficient employees at Livermore so that the M.T.A. and Project Whitney continuing programs would not be curtailed during the Teapot test period."⁵⁷ Thanks to these activities, Livermore was becoming a mid-size city in the Bay Area by the mid-1950s.

As journalist Lillian Lauer reported in 1954, "Instead of the railroad, Livermore's main link with the rest of the Bay Area as well as the Central Valley [was]... Highway 50—since 1951 a four-lane modern freeway... Many workers employed at the Radiation

⁵⁵ San Francisco Field Office, U.S. Atomic Energy Commission, For release at 12 Noon Eastern Standard Time Saturday, January, 1954, 058---, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

⁵⁶ Berkeley Radiation Laboratory internal memo to all department heads, February 1, 1954, 068669, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

⁵⁷ U.S. Atomic Energy Commission, Financial Plan – Fiscal Year 1955, 071149-071151, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley; The MTA, or Materials Testing Accelerator, was an atom-smasher that was initially supposed to be the focus of the Livermore site. However, it was in operation for only two years before it was dismantled. See, Alden P. Armagnac, "The Most Fantastic Atom-Smasher," *Popular Science*, November 1958, p. 115; The Bevatron is another particle accelerator at Lawrence Livermore that had a longer life than the MTA. However, it was slated for demolition as of 2008; Project Whitney was the name for the early weapons design program at Livermore; The Teapot Test Period was when the tests for Operation Teapot, which would measure the evolution of atomic clouds among other things, were conducted at the Nevada Test Site in 1955.

Laboratory and the other technical scientific companies it has spawned do not reside locally but commute daily over the route the Forty-niner wagon wheels once scored.” However, agriculture remained an economic mainstay of the town. Farm products, gravel production, and miscellaneous manufacturing engaged many residents. The Lab and Sandia Corporation were just two of many employers in 1950s Livermore, which was by no means a company town.⁵⁸ However, the labs’ growing presence began reshaping the city during that decade.

Growth-induced changes were everywhere. For example, the first traffic signal began operating in June 1951, at First and L Streets (the main intersection of downtown) in response to jaywalking problems. Before this, Livermore had no need for such lights. Slowly, the city took small steps toward updating its infrastructure.⁵⁹ It soon became clear, as it did in Albuquerque (because of the Sandia Lab) and in many other postwar cities, that available housing could not accommodate the growth Livermore was experiencing. In 1951, as one local report noted, those in search of housing would either need a lot of money to purchase a home, or they would have to rent, with “their chances of finding a good rental, or any rental...[being] practically nil.” The situation was dramatically “aggravated by the arrival of more and more new workers at the Livermore plant of the Atomic Energy Commission now being constructed by the California Research and Development Company on East Avenue.” Long-term residents gradually realized that growth came with a price, not only because the local identity of Livermore would to a large extent become defined by the presence of the Lab, but also because of

⁵⁸ Lillian Williamson Lauer, *The Community Press in Livermore, California: A Case Study*, A Thesis Submitted in Partial Satisfaction of the Requirements for the Degree of Master of Journalism in the Graduate Division of the University of California, 1954: 16-17; 18.

⁵⁹ “Traffic Signals Now In Operation,” *The Livermore Herald*, June 29, 1951.

the possible economic dependence on defense spending that the newly dominant industry might bring to the city.



Figure 9 Some homes were available in Livermore, particularly for veterans, in the 1950s, as evidenced by this advertisement. Courtesy Livermore Heritage Guild.

While Mayor H. W. Anderson may have “toasted with a bottle of bourbon the agreement to accept the laboratory into the community,” municipal leaders realized that the Lab would soon overwhelm the city’s existing housing stock.⁶⁰ As Chamber of Commerce Secretary Joseph T. Smith observed with some frustration, “I don’t know what to tell these people. Naturally we want the city to grow, but the room just isn’t here for them.” Indeed, local merchants complained about losing the business of people who worked in Livermore but were forced to live and shop elsewhere.⁶¹ In July 1951, Mayor Louis Gardella planned to introduce an ordinance annexing 119 acres east of the city for

⁶⁰ Douglas A. Greenberg, “Growth and Conflict at the Suburban Fringe: The Case of Livermore-Amador Valley. Dissertation, University of California, Berkeley, 1986.

⁶¹ “Livermore Cannot Meet Housing Demands,” *The Livermore Herald*, July 20, 1951.

housing, which eventually happened. But as one local editorialist asked, “What help can it give? How can an already over-crowded little city, which finds it impossible to meet the present demand for rental units, be of assistance in a time of still greater need?”⁶²

Local officials considered aggressive plans for new homes. In 1955, developers proposed building almost 200 new housing units. However, the Planning Commission rejected one subdivision intended for land behind the Junction Avenue School, because there were not enough entrances to the area and the lack of streets would discourage development further east. This might be seen as one of the first indications of how cautious Livermore leaders would be with regard to city expansion. Commissioners sent the plans back for revision, and the city continued to suffer from a housing shortage.⁶³ Infrastructure was also inadequate. Sewer hookups were a central issue because the valley’s basin drains into the Niles Cove, which provides fresh water for the Alameda County Water District. In 1956, the Sewer Study Group, a subcommittee of the Livermore Citizens Committee, recommended the expansion and renovation of the municipal sewer system, based on the projections that the Sandia and the Livermore labs, along with other local industries, would add 10,000 more residents in the next two years.⁶⁴ These amenities eventually came in the 1960s, but lengthy delays drew criticism from planning experts.

⁶² “City Moves To Annex 119 Acres,” *The Livermore Herald*, July 20, 1951.

⁶³ “At Least 500 Homes Are Planned or Under Construction,” *The Livermore News*, January 17, 1955.

⁶⁴ “Sewer Study Group Findings: 10,000 Newcomers Expected in 2 Years,” *The Livermore News*, June 24, 1956.

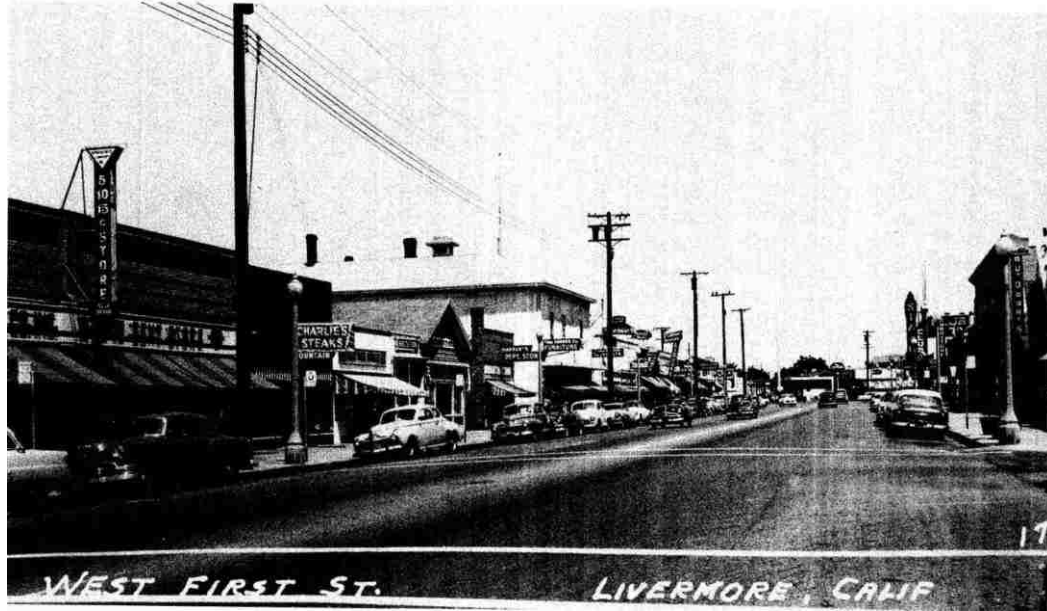


Figure 10 Livermore’s First Street in 1954 was a mixture of commercial and residential space. However, amenities desired by the growing population were not always available in Livermore, and business owners complained that Lab employees preferred to shop elsewhere. Courtesy Livermore Heritage Guild.

In 1959, Berkeley’s Howard Gardner, associate director of the League of California Cities, urged Livermore’s leaders to start planning for rapid growth in their East Bay county, otherwise, they might incur unnecessary costs. A local newspaper column, reflecting the experts’ consensus that “Livermore IS going to be metropolitan,” advised the city to step up the pace and work with the other nine counties in the Bay Area to accommodate growth.⁶⁵ In the 1950s, the downtown business area expanded. Automobile sales agencies prospered along First Street beyond L Street, but growth of downtown businesses threatened nearby homes. As residential land use yielded to commerce, several dwellings were demolished. Other early twentieth-century residences, however, especially on Third and Fourth Streets, were connected to stores and offices,

⁶⁵ “Livermore IS Going To Be Metropolitan,” *The Livermore Herald*, January 23, 1959.

which saved them from the wrecking ball. These events convinced some concerned citizens that without vigilance, the city would lose many of its historic assets.

As urbanization continued unabated, the unoccupied Southern Pacific Railroad depot was also threatened with demolition. A grassroots preservation group formed and convinced the Council to intervene. Livermore's local historical society emerged from this movement, eventually saving the depot, but it was not until 1978 that the Council established a City Preservation Commission.⁶⁶ As early as the mid-1950s, however, municipal leaders recognized the need to hire people familiar with big-time city-building. In 1956, City Administrator Dean Haug announced that a planning consultant was advising him about city growth and the need to establish a public works department.⁶⁷ Haug pursued a modernization course to address such issues as crowded schools, more sewers, storm drains, and traffic lights as well as higher salaries for the growing number of city workers.⁶⁸ Clearly, by 1956, Livermore had become a mid-sized city, which required many policy adjustments and departures from the past.

At a public relations dinner of the Business and Professional Women's Club in September 1956, Mayor B. O. Burch heard about measures Livermore might consider to preserve the "small town" atmosphere beloved by longtime residents. This included making planners aware of the public's desire to maintain the traditional setting by the implementation of large "lot sizes, street widths and tree planting programs." By adopting a general plan, Livermore could incorporate these ideas and integrate them with an

⁶⁶ Gary Drummond, city historian, unpublished materials, Livermore Heritage Guild.

⁶⁷ "City Government Is Geared to Growth, Administrator Says," *The Livermore News*, June 29, 1956.

⁶⁸ "City Council Meeting: Job and Salary Survey OK'd," *The Livermore News*, June 29, 1956.

expanded sewer system, a new city hall, and a modern water system that would allow the municipality to import water to ensure an abundant supply for increased residential and commercial use and fire protection. This was a major step that Mayor Burch and City Councilmen were quick to take.⁶⁹ Within a few weeks, the city commissioned Harold F. Wise, Associates to prepare a general plan for the growth of Livermore up to 1980.

The plan, completed in summer 1957, was “based on a startling assumption; that in the next 23 years Livermore is going to increase its population 5 times,” to a population of approximately 60,000, and to not plan accordingly would be “foolhardy.” In fact, the authors asserted that Livermore had already “begun to feel the impact of being directly adjacent to the metropolitan bay area” and was experiencing “growing pains from metropolitan spill-over and growth.” One of the plan’s major goals was to reserve sites in advance for such public facilities as schools and parks before they were committed to other uses and before land became almost prohibitively expensive. The consultants noted that Livermore had plenty of land for expansion, but made sure that it did not come at the expense of agriculture, where the lands, they felt, should be “kept in productive (and tax-paying) use for as long a time as possible.” This was a far cry from the aggressive annexation policies of cities like Phoenix, Albuquerque, and other postwar places that were designed to expand a city’s tax base willy nilly with industry and housing, with little thought to coordinated growth. In contrast, Livermore’s leaders and residents were determined to safeguard the agricultural countryside that they believed had long contributed to their town’s charm.

⁶⁹ “Livermore Can Stay Like A ‘Small Town,’” *The Livermore Herald*, September 28, 1956.



Figure 11 The train depot, pictured here in the 1950s, was saved from demolition by the Livermore Heritage Guild in the 1970s. The historic preservation movement in Livermore dovetailed with the slow-growth movement that began in the 1960s. Courtesy Livermore Heritage Guild.

The plan anticipated two major areas for industrial development: one for general industry east of the city, and another for research and development firms near the Sandia Corporation and the U.C. Radiation Laboratory. The plan anticipated the UCRL workforce growing from 2,400 to 5,000 and at Sandia Corporation from 125 employees to 1,110 by 1980. However, the plan preserved agricultural land, because as the consultants warned, “certainly much of the attractiveness of the Livermore Valley as a place to live would be destroyed if agriculture disappeared.”⁷⁰

Livermore’s General Plan was adopted by the City Council on May 4, 1959. A condensed version, devoid of “superfluous” information, focused on the consultants’ major

⁷⁰ *General Plan for Livermore, California to Guide the City’s Growth Between 1957 and 1980*, Prepared by Harold F. Wise, Associates, 546 University Avenue, Palo Alto, California, August 1957: 9, 21; 77; 80; 37-39.

proposals: recognizing that Livermore would grow to be a “major urban center of Alameda County and the San Francisco Bay Area,” and that growth should be guided by mixed land uses, economical expansion, preservation of agricultural land, and municipal accommodations of growth.⁷¹ Livermore was perhaps over-prepared for growth compared to places like Albuquerque, whose population soared far beyond what postwar planners had estimated and thus failed to allow for.

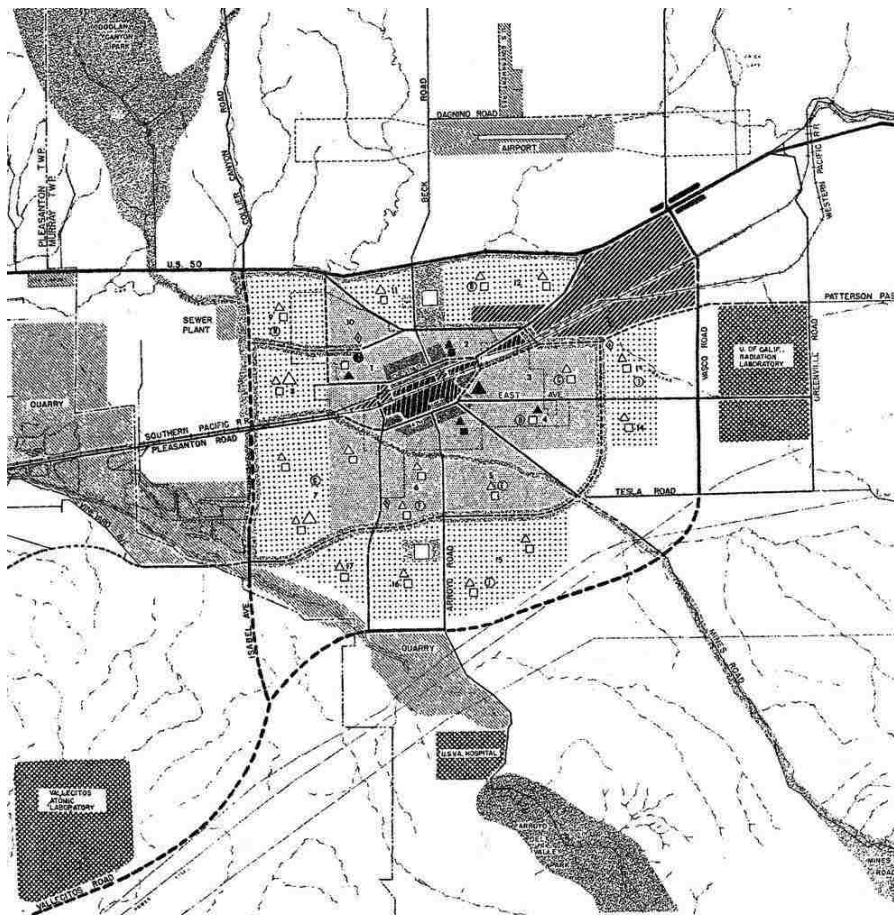


Figure 12 The general plan in the 1950s promoted mixed land use, promotion of agriculture, and attention to the needs of an expanding population. At the request of residents, planners were careful to preserve agricultural areas in an effort to highlight the city’s historic economic mainstay and avoid a “slurb-like” appearance. (General Plan for Livermore, California, 1957.)

⁷¹ *City of Livermore General Plan for Community Development 1959-1980*, April 1959: 3-4.

By November 1959, the construction of almost 2,500 new houses presaged the arrival of about 9,000 new residents to Livermore. Newly appointed Public Works director Dan Lee assured city leaders that supporting these homes would be “360 feet of sewer line, 160 feet of storm drain, 1,000 feet of gas and water pipe backfill, 480 feet of curb and gutter, 480 feet of sidewalk and driveways, and 5,000 square feet of grading and paving.” These events clearly demonstrate that Livermore quickly embraced the need for planning, public works and infrastructure in its forced march toward mid-city status in the 1950s.⁷² But unlike Phoenix, Tucson, Las Vegas, and other cities boosted by Cold War defense spending, Livermore did not embrace growth for long. By the early 1960s, many residents would no longer view rapid urbanization as inevitable or even desirable.

The laboratories drove the city’s growth throughout the 1950s. Livermore was the fifth fastest-growing city in California from years 1950-1953, and the pace hardly slackened after that.⁷³ In 1954, George C. Manov, director of industrial development for the AEC predicted that more than \$500 million would be spent at the Livermore and Hanford Labs on projects that would make atomic energy available not only to the Pentagon, but the public as well.⁷⁴ Federal dollars and newcomers flooded the city. This influx had a dramatic effect on the community’s atmosphere, resulting in some tension. While oldtimers either welcomed or were ambivalent toward the new, highly educated

⁷² “2,377 New Houses In The Works Here,” *The Livermore Herald*, November 6, 1959.

⁷³ “Fifth Fastest Growing City,” *The Livermore Herald*,” August 14, 1953.

⁷⁴ “Peace-Time Atomic Work at U.C.R.L.,” *The Livermore Herald*, April 30, 1954.

workers at the labs, others detested the newcomers with metropolitan tastes, leading to an air of mistrust and misunderstanding between the groups.⁷⁵

Public schools were a case in point. In Livermore, public education became a focal point for community discussion and political controversy in the 1950s.⁷⁶ Expensive new bond issues resulted from the postwar baby boom and the influx of defense workers. According to Susan Canfield, a retired primary teacher who taught in Livermore for almost 40 years, “Between 1953 and 1957 there were schools that were on double-session...even before California Research and Development came in 1950, there was an influx of population, possibly because of folks stationed at Camp Shumaker and Camp Parks who remained in Livermore—the need had been there already.”⁷⁷ An additional problem arose over whether the city high school’s emphasis should be vocational or college preparatory. While longtime residents thought that traditional, rural occupations should be stressed, the “labber” parents wanted a more advanced curriculum that would prepare their kids for college.

While most cities hosted postwar debates over curricula and the need for more schools, these discussions usually resulted in mature compromises and consensus. But in Livermore, the debate grew bitter at times and reflected the continuing tension in the

⁷⁵ David Kang, who grew up in Livermore, wrote his bachelor’s degree thesis on Livermore in the 1950s, called “Bumpkins and Eggheads,” in which he describes the tensions between “oldtimers” and “newcomers.” In his research, Kang found that “The cultures of the Laboratory and the ranch were in juxtaposition in many ways—economically, educationally, and culturally. The general response varied with each individual person—some of the native Livermorons were very happy to have the lab here and though that no conflict existed. Others hated the labbies and make fun of them to this day.” David Kang, Stanford University Anthropology Department, Honors Thesis B.A., “Bumpkins and Eggheads: A Cultural Look at Livermore in the 1950’s;” On a side note, While David Kang finds the term “Livermorons” acceptable, and it is probably in use by people who live in Livermore, I have opted to use the term “Livermoreans” outside of direct quotes in this paper.

⁷⁶ “What’s the Effect of Growth on Schools?” *The Livermore News*, January 13, 1955.

⁷⁷ Susan Canfield, conversation with the author, June 4, 2009.

community between old and new residents clinging tenaciously to their country and city values. As Canfield noted, the “oldtimers” and lab workers regularly snubbed each other in the 1950s. For example, she related how her father’s family moved to Livermore in 1911, and recalled that “My father was not college educated, but he had a very global outlook.” So, he took to the newcomers more readily than other oldtimers, yet “many of the oldtimers perceived [the] newcomers as radicals.” Canfield’s father, however, worked closely with many of the lab people, first at California Research and Development as an industrial photographer, and later at Sandia in the same capacity. But unlike him, many local ranchers and other citizens were disgruntled by the changes and cosmopolitan values that the newcomers brought to Livermore. “There are people who don’t want to see change,” Canfield remarked about the older residents when questioned about Livermore’s transformation after the “labbers” arrived.⁷⁸

Tensions only grew over time. As Canfield remembered, “There was a lot of resentment because they [newcomers] looked toward change without looking at Livermore history...The oldtimers called them ‘labbers.’” However, according to Canfield, it did not matter whether the newcomers worked for a radiation laboratory, nuclear weapons laboratory, or any other kind of industry. Whatever organization or industry the newcomers worked for, “they [the ranchers] liked their community to remain very rural.”⁷⁹ With regard to living in a “laboratory town,” Lotchin’s assertion that “Californians did not share the traditional American suspicion of and fear of the military”

⁷⁸ Kang observed in “Bumpkins and Eggheads” that “The natives used open space as a preserve, a place to slow down, and a way to force obligations that pulled one closer into the web of Livermore. Conversely, the labbers perceived space as a place in which to put new things, a place that represented the potential for more progress and advancement.”

⁷⁹ Susan Canfield, conversation with the author, June 4, 2009.

appears to be correct.⁸⁰ In Livermore, citizens were more concerned with any dramatic change in their community culture than about the arrival of a new base or research facility. The key, in Livermore and probably elsewhere, was how the new government employees and their families reshaped local customs as well as the town's physical appearance. Indeed, as Canfield observed, when Roy Jenkins started developing tract homes parallel to East Avenue nearby the Livermore Lab, "it was concentrated [with PhDs] in those blocks," which was in stark contrast to the older neighborhoods nearby.⁸¹ As in Albuquerque, this clustering would result in the formation of a political bloc whose ideology and interests would conflict with residents, mostly oldtimers, in other areas.

As early as 1959, the *Wall Street Journal* noted that the presence of a nuclear weapons laboratory in Livermore had eroded the town's rural atmosphere. Reporter Jonathan Spivak mentioned that while the "townsfolk at first showed no love for the Ph.D.s," at the same time, they seemed "remarkably calm, even unconcerned, about the danger of a possible explosion" at the lab. Regarding the changed townscape, he noted that Livermore's growth naturally brought a sharp rise in the amount of taxable property, but also added that the tax base's growth had risen in relation to the amount of city services required by the new population. Meanwhile, homebuilding continued to boom in 1959, with one local realtor estimating that annual home construction was four times what it had been before the Lab's arrival. But not all businesses benefitted. Spivak reported that oldtimer business owners were bothered when Lab employees spent their money in nearby San Francisco and Oakland rather than in Livermore. As one store

⁸⁰ Lotchin, *Fortress California*, 259.

⁸¹ Susan Canfield, conversation with the author, June 4, 2009.

owner complained, “The guy from the laboratory is... a little on the snobbish side,” while another remarked, “They’re rude, (the lab people), very rude. I think they have the feeling this is a hick town, that it just isn’t good enough for them.”⁸²

Long-time residents clearly resented the perceived elitism and occasional arrogance of the “labbers” and their family members. As Canfield recalled, “Medical doctors in Livermore would get a twenty percent discount at the drug store I worked at during high school. I worked there...1961 to 1965. Well, many of the wives of these PhD ‘doctors’ came in...it was kind of a laughing matter when women would come in and say, ‘Charge it to Dr. Jones’ or whoever, their PhD husband, because they weren’t really doing it for the discount—I doubt they even knew about the discount—but they just wanted to show that their husbands were PhDs.” Canfield’s resentment was obvious and no doubt reflected other residents’ views. “A lot of people who moved to Livermore wanted to wear on their shoulder their status or money...” but as she explained, “old money has always been low key in Livermore.” She recalled that the newcomers only began to ingratiate themselves when lab employees began to take positions in city government and took interest in changing the city administration structure.”⁸³

While some oldtimers resented how city government began to change, they slowly adjusted to it. In a 1983 interview, John Shirley described his appointment to the Livermore Planning Commission in 1956 as being partially due to Mayor Barny Burch thinking that it was time for new blood in local government. According to Shirley, when

⁸² Jonathan Spivak, “Atoms & Livermore: How Scientist Invasion Changes Life in Quiet California Community,” *Wall Street Journal*, April 20, 1959.

⁸³ Susan Canfield, conversation with the author, June 4, 2009.

he was appointed, “everyone else resigned protest, aside from the chair.”⁸⁴ Yet Shirley was undeterred and accomplished much. While serving on the commission, he identified the reasons why a bond to upgrade the sewer system failed at the polls, and “made new and successful recommendations for a new and eventually successful election.” He remembered some oldtimer opposition to modern land use planning, but recalled how the city slowly fostered a community appreciation for the importance of land use planning. He laughed when he recalled that “it’s funny when you think back fifty years to how primitive it was.”⁸⁵ But residents had to learn quickly when residential developers started pressuring Livermore for room to construct tract housing.

Shirley recalled that from the beginning, developers were aggressive. In more than one instance, he took them to court to enforce a \$169 per home sewer fee as well as charge a \$125 per house recreation fee for parks. According to him, developers always resisted these charges, which they would later claim made Livermore unamenable to growth. City planners, however, would claim that they were just trying to make new housing sustain itself in the community, as schools were increasingly overcrowded, and issues of pollution and water were beginning to strain valley resources.⁸⁶

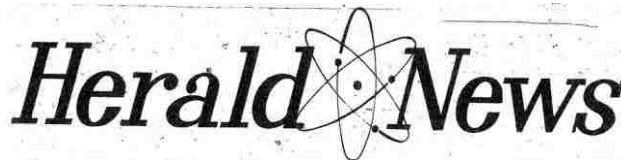


Figure 13 The *Livermore Herald* bought out the *Livermore News* in the 1960s. Changing with the times, the *Livermore Herald* became the *Herald News*, and its logo certainly indicates an acknowledgment of the atomic community. (*Herald News*, February 5, 1969.)

⁸⁴ John Shirley, conversation with the author, February 12, 2010.

⁸⁵ *Livermore Heritage Guild Newsletters Collection*, May 1983, The Bancroft Library, University of California, Berkeley.

⁸⁶ John Shirley, conversation with the author, February 12, 2010.

One California graduate student attempted to explain the conflicts that emerged within the community by examining the city's two newspapers. As she wrote, "one of the editors of the community's two newspapers was an 'oldtimer,' the other a 'newcomer.'" However, both editors Lionel Horwitz (*Livermore News*) and Maitland R. Henry (*Livermore Herald*) acknowledged the town's assimilation problems. According to newcomer Henry, "Many of [the Atomic Energy people's] bonds were still with Berkeley... They came to Livermore thinking they would be mixing with a bunch of rural, uneducated people. They were hard to talk to—physicists or mathematicians, for the most part—and what they work at was secret." But Henry observed that the newcomers gradually saw the community as a good environment to raise children, and the initial distrust began to fade as all residents strove to make their community a pleasant place to live.⁸⁷ *The Livermore News* echoed the sentiments of the *Sandia Lab News* in a January 1960 article about why Sandians liked Livermore. Among the reasons cited were proximity to vacation spots and metropolitan centers, the quality Livermore's school system, the weather, and the "personal touch" that comes with living in a smaller town.⁸⁸

Clearly, the 1950s were a prosperous though turbulent decade for traditional Livermore residents, who obviously welcomed the dramatically expanded tax base and infusion of federal funds, but balked at the changes, both physical and social, that

⁸⁷ Lillian Williamson Lauer wrote a master's thesis in 1954 comparing two newspapers in Livermore: the *Livermore Herald* and the *Livermore News*. While she collected a substantial amount of data for her thesis, her statistical analyses were made from a sample of only 66 people, which is insufficient to cite with much confidence. However, her analysis sheds light on the transitions the city was experiencing in the postwar years. For Lauer, the soaring population between 1945 and 1955 resulted from a "four-lane highway, an atomic radiation laboratory, [and] a large air force base." As noted, this growth caused problems. In 1954, Lauer contended that "sewers, schools, fire protection, zoning laws are inadequate. Recreational facilities, shopping areas, civic improvement are areas of concern for oldtimers and newcomers alike. In addition to overburdening the physical facilities of the town, the population influx has created the problems of assimilation. Today Livermore is a small city in conflict, the old with the new." Lauer, *The Community Press in Livermore, California: A Case Study*, 1; 83; 65; 61.

⁸⁸ "Sandians Tell What They Like About Livermore Life," *The Livermore News*, January 1, 1960.

accompanied growth. Spiraling population, expanded government, crowded schools, and value conflicts leading to pointed debates over public policy in many areas resulted in ambivalent feelings about the changes for many longtime residents. As the 1960s approached, community institutions were still strained, and many citizens looked with uncertainty toward the new decade that was bound to bring still more change to the once primarily agricultural town.

CHAPTER 3

NEW CHALLENGES IN THE 1960s AND 1970s

Livermore Lab in the 1960s

Livermore continued to grow in tandem with the lab's expansion. However, this was not without administrative disruption within the facilities and protest from city residents. The Livermore Lab's staff underwent significant change in the 1960s. Edward Teller, who had assumed directorship of the Livermore Lab in 1958 on a temporary basis, resigned his position in 1960 to return to teaching. Harold Brown replaced Teller.¹ President John Kennedy then named Brown to the post of director of defense research and engineering for the Department of Defense in March of 1961, succeeding Herbert York in this position, who had also been a director at Livermore in past years. Teller returned to work at Livermore after Brown's appointment in Washington. But after the testing moratorium and cancellation of such initiatives as Project Pluto, Teller again resigned in 1965.² Despite these personnel changes, the lab's work remained steady and made a continuous national defense contribution.

Later directors John Foster and Michael May successfully pushed for the lab's expansion and increased status. In the 1960s, due to increased confidence in the work accomplished at LLNL, the Air Force began assigning projects to the Lab that previously would have gone to Los Alamos. The Biomedical Division at Livermore, established in 1963, investigated the effects of radionuclides on living systems. The significance of this research became evident in the 1970s and 1980s, when "Livermore-devised instruments,

¹ "Dr. Teller Resigns Radiation Lab Post for More Teaching," *Chicago Daily Tribune*, May 24, 1960.

² Project Pluto's aim was to develop a nuclear-powered ramjet engine for use in cruise missiles.

notably the flow cytometer, made the Laboratory a world center for analytic cytology.”³ This brought more grants and funding to the lab as well as corresponding growth to the city, which was welcome news since the moratorium on nuclear testing had briefly threatened to reduce the Lab’s size and importance.

The moratorium forced the Sandia Lab in Albuquerque to diversify its research, and the same was true at Livermore. As one historian noted, by 1962 the latter had “at least one nuclear propulsion program going to...develop civilian nuclear energy...to use nuclear technology in mining, water, irrigation, excavation and the mass production of radioisotopes.” Los Alamos also took heed and “diversified from concentration on weapons to atomic energy, fusion power, basic research, Project Plowshare, and nuclear propulsion.”⁴ Despite this diversification, however, pro-nuclear advocates, such as Representative Chet Holifield (D-Calif.) pressed for atomic testing to resume. In response to test ban advocates who warned that if testing resumed, people worldwide would become alarmed and “blame” the United States, Holifield countered that “we must be willing to accept criticism from those who are not responsible for our national safety and who, in most instances, are misinformed or uninformed on the reasons for making the decision.” He also mentioned frequently that the Soviets had been secretly conducting testing during the 33-month moratorium.⁵

³ “UC Nuclear Director Named to Defense Post,” *Los Angeles Times*, March 10, 1961. Barton Hacker, “A Short History of the Laboratory at Livermore,” *Science & Technology Review*, Regents of the University of California, (September 2008): 16; 17; 19.

⁴ Roger W. Lotchin, *Fortress California, 1910-1961: From Warfare to Welfare*, (Urbana: University of Illinois Press, 1992):, 290-291; Project Plowshare was a program intended to use peaceful nuclear explosions for civil engineering purposes, such as nuclear excavation.

⁵ “The Case for Atomic Testing by U.S.,” *U.S. News and World Report*, July 17, 1961, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

Holifield was not alone in his desire to resume testing or in his distrust of the Soviets. During the Cold War's early years, hawks like Secretary of State John Foster Dulles believed that the United States depended on deterrence via the development of nuclear weapons and strategic bombers.⁶ Defense-conscious congressmen shared that view and supported funding of nuclear research. However, many of the Golden State's representatives used the national interest as a convenient cover for securing billions in defense spending for local defense plants and the cities that hosted them, including Livermore.⁷ Indeed, by the Livermore Lab's tenth birthday in 1962, it had grown in both the value of funded research and the number of personnel (4,600 employees, 1,100 of whom were scientists and engineers). The number of the Lab's accomplishments had grown, too. The weapons research program, which comprised about half of the Lab's effort, was still classified in 1962, but a press release disclosed that tests had been conducted at the Nevada Proving Grounds and at Site 300 at Corral Hollow, just fifteen miles from the Livermore Lab.⁸ The AEC's San Francisco office announced in February 1963 that over \$4 million was spent the previous year just for construction at the Lawrence Radiation Laboratory and Sandia Corporation. Unfortunately for the city of Livermore, however, only one out of five contractors for the facility was based in town.⁹ Livermore's growth did not necessarily stimulate blue collar work in the valley as it did

⁶ Carl Abbott, *The Metropolitan Frontier*, (Tucson: University of Arizona Press, 1993): 57.

⁷ Roger W. Lotchin, *Fortress California, 1910-1961: From Warfare to Welfare*, (Urbana: University of Illinois Press, 1992): 294.

⁸ Press Release, August 24, 1962, 073418-073422, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

⁹ "AEC Reports \$4 Million Spent for Building Here," *Livermore Herald & News*, February 15, 1963.

in Albuquerque, where Sandia Corporation offered a number of non-technical positions. In contrast, Livermore employed a staff with mostly graduate degrees.

Nevertheless, the 1960s were a decade of growth for the lab and city. Contributing to the defense-based prosperity were efforts by the Kennedy and Johnson administrations to lure more talented students into science and engineering. The Higher Education Facilities Act of 1963, like the earlier National Defense Education Act of 1958, produced more trained personnel for the defense industry by funding construction of more buildings and providing seed money for more tech-oriented campuses. However, the bulk of this allocated money flowed into well-established research and development institutions, such as Livermore Lab and Sandia.¹⁰ Sandia Corporation in Livermore was still growing in 1967, with almost 1,000 employees and a total payroll of \$9.6 million.¹¹ In addition, city and chamber of commerce officials attempted to attract more industry to Livermore. Overall, they were unsuccessful in this effort, yet the labs were not slowing down, and the host city's infrastructure had to keep pace.

Slow Growth and Civil Rights

Livermore's population nearly quadrupled between 1950 and 1960, rising from 4,364 to 16,058. By 1960, the Bay Area Council estimated that Livermore's population would quadruple again to almost 71,000 by 1990. Everyone expected growth in Livermore, but it remained to be seen if the city would, in fact, grow to such

¹⁰ Margaret Pugh O'Mara, *Cities of Knowledge: Cold War Science and the Search for the Next Silicon Valley*, (Princeton: Princeton University Press, 2005): 49; 52.

¹¹ "Sandia Pay Total Rises," *Livermore Herald & News*, January 5, 1967.

proportions.¹² The “unbelievable” Livermore population of 19,200 in 1962 was important to taxpayers, because according to City Manager William Parness, the special census might qualify the city for \$30,000 in state grants that were routinely allocated to cities on a per capita basis.¹³ Finally, this growth also brought some ethnic diversity, although the majority of residents remained white.

	1950	1960
Population	4364	16,058
Native Born	1,783	15,442
Median Number of School Years Completed	10.6	12.6
Largest Occupation	Craftsmen	Professional and Technical Workers

Table 2 The population of Livermore exploded during the 1950s. In addition, this expanded population contained more native born, educated, and professional residents.

The native born total population stayed proportionally high; out of the total population, almost half were born in California. Only 146 men and 124 women in Livermore were nonwhite; six black men and eight black women were included in the 1960 census.¹⁴ Unfortunately, it is difficult to estimate how many Hispanics lived in Livermore at this time, because they were still listed with “white” residents on the census. Yet racial composition was not the only change. A comparison of the 1950 and 1960 data reveals a clear change in the labor force, particularly with regard to educational background. The median number of school years completed rose to 12.6 years, and over

¹² “Imagine Livermore With Population of 286,400,” *The Livermore Herald*, March 18, 1960.

¹³ “Believe It Or Not, 19,200 People Live Here,” *Livermore Herald & News*, June 12, 1962.

¹⁴ 1960 Census of Population. *Volume I. Characteristics of the Population. Part 6. California*. United States Department of Commerce. Bureau of the Census: 6-31; 6-274; 6-97; 6-135.

1,000 Livermore residents had completed college. The largest occupational group out of 4,191 employed males was professional, technical, and kindred workers (1,548), replacing the traditional dominance of craftsmen in previous decades.

In 1960, almost 500 engineers resided in Livermore, but only 56 percent of the Radiation Lab employees lived there, which was a concern for local politicians and business leaders.¹⁵ One newspaper speculated that perhaps the “labbers” preferred to be someplace between the two labs (Berkeley and Livermore). However, another factor may have been the lack of shopping and cultural amenities in Livermore.¹⁶ But affordable housing for lab workers was no longer the issue it had been a decade earlier.

At this time, new and relatively new tract homes comprised almost three-fourths of the current available housing in Livermore. A pamphlet guide for new residents prepared by the Livermore Chamber of Commerce boasted that “now under construction are six residential tracts. The city building inspector is processing two additional residential tracts consisting of 3,413 single family dwellings.” There would also be two additional tracts by 1962, including one for senior citizens, totaling 3,313 single family and 642 multiple occupancy dwellings. A huge shopping center, two 18-hole golf courses, a driving range, and a clubhouse added to the new Springtown community’s appeal for seniors.¹⁷ According to a report from the city building inspector, residential and commercial construction in Livermore increased 50 percent from 1965 to 1966.

¹⁵ Ibid., 6-294; 6-314.

¹⁶ “56 Pct. Of Lab Staff Live Somewhere Else,” *The Livermore Herald*, January 1, 1960.

¹⁷ *Livermore Facts* was a pamphlet produced cooperatively by the Livermore Chamber of Commerce, Lawrence Radiation Laboratory, Sandia Corporation, Livermore Laboratory, General Electric Vallecitos Atomic Laboratory, Livermore Joint Union High School District, and the Livermore School District, Unknown date (post-1962).

However, the source also noted that “rising interest rates by banks and savings and loan institutions have made home loans harder to secure.” Despite uncertain availability of down payments and loans, there were plenty of houses available for those who wanted to live in Livermore by the mid-1960s.¹⁸

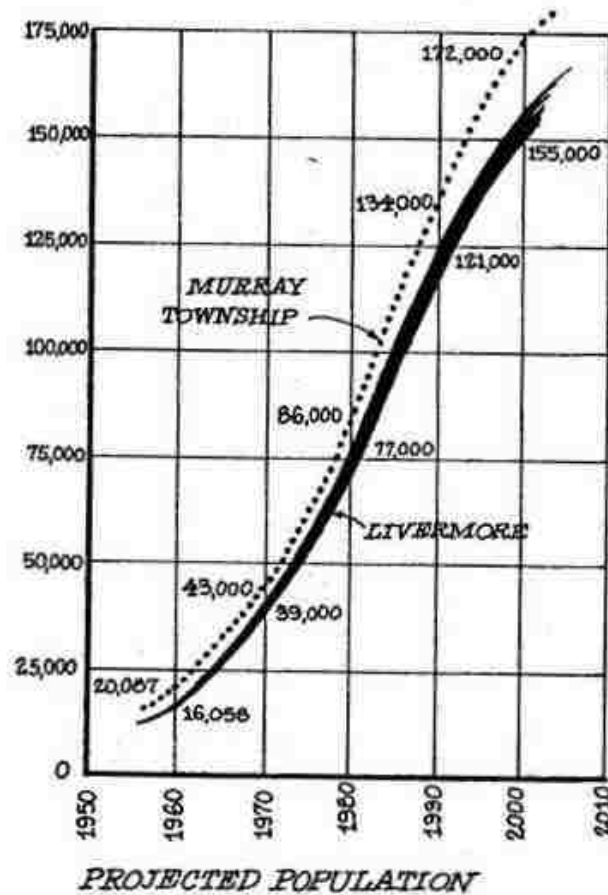


Figure 14 In 1966, a Land Development Guide provided by the Livermore City Council projected a growth in population to over 150,000 by 2010. This certainly did not happen, with the estimated population of Livermore being under 80,000 in 2009. Nevertheless, Livermore prepared for growth.

¹⁸ “Livermore Has Building Boom,” *Livermore Herald & News*, July 25, 1966.

Still, homebuilders were anxious to exploit Livermore's construction market further, but they would find themselves battling with residents, who demanded high development standards and wanted the city equipped with adequate infrastructure before encouraging further growth. Most of these activists were labbers, the same affluent suburbanites responsible for the growth that had raised concerns about pollution and suburbanization. Suddenly, as pro-growth advocates would later charge, the labbers wanted to keep Livermore for themselves and spend city money on cultural centers for their bucolic retreat.¹⁹

Argo Sales Company Presents—
NEW HOMES IN LIVERMORE

GRANADA VILLAGE

Featuring—
VETS: NO DOWN

G.I. and FHA Buyers **\$99** Total Closing Costs

LOW FHA TERMS
Priced From - \$12,950

- Just Minutes Away From Your Work
- Convenient but unhurried suburban atmosphere
- Schools, churches and shopping handy
- Excellent environment, climate, neighbors

Figure 15 Granada village tract homes were built in the southwest area of town in the 1960s. Housing had become readily available for workers within the city limits. Courtesy Livermore Heritage Guild.

¹⁹ It is uncertain whether the slow-growth movement in Livermore, which was mostly supported by lab workers, became the favored approach to city management specifically because these residents were employed by the labs or because they tended to be upper-class and educated. Indeed, the case could be made that Livermore's reaction against growth in the 1960s may not have been specific to its identity as a "lab town," but instead mirrors the experiences of other cities that are home to a wealthier majority population, possibly due to a prosperous university or private industry nearby.

In 1964, consultants submitted a master plan for a new 42-acre Community Park-Civic Center based on a projected local population of 77,000 in 1980 and 155,000 in 2000. The architects and planners argued that the Community Park-Civic Center “should not become a magnet of unjustified and unplanned growth and leap-frogging of development that will foster urban sprawl to the detriment of the city as a whole.”²⁰ The bond passed, although former mayor and LLNL employee Don Miller, among others, felt the City Hall should have remained downtown to cement the city center.²¹ Despite this, Miller believed that cultural events and centers were important for Livermore and that the new civic center would help revitalize the city by providing more space for administrative buildings than was available downtown. He also asserted that “Livermore has been the cultural center of the valley since the lab came,” and in the 1960s he worked to generate more cultural activity by encouraging the creation of a symphony orchestra and an amateur theater group. Other residents wanted not only to infill Livermore, but to also expand the city’s borders. Newcomer, veterinarian, and former mayor John Shirley said that when he served on the City Council (1958-1966), he had no real agenda aside from “good governance,” and that he supported beautification projects that residents eventually appreciated. He also noted that growth benefitted the valley and that a “lot of oldtimers don’t realize how beneficial this growth was. We gave them a hospital... [and] kept their rodeo going.”²² Shirley noted that “growth just came naturally” and that the

²⁰ *Master Plan: Livermore Community Park-Civic Center*, Prepared in 1964 by Ratcliff-Slama-Cadwalade, Architects; Ribera & Sue, Landscape Architects and Site Planners; Warren W. Jones, City & Regional Planner; Francis Violich, City Planner; According to the United States Census, Livermore’s total population was about 73,000 in 2000.

²¹ Don Miller, conversation with the author, February 11, 2010.

²² John Shirley, conversation with the author, February 12, 2010.

“developers were the aggressive ones” who constantly looked to profit from Livermore’s growth.²³ Further development would continue into the late 1960s and early 1970s.

In 1969, Livermore officials prepared a plan for redeveloping downtown to attract more housewives and local businessmen. The argument was that a “balanced” city has a progressive, attractive, and convenient downtown. The Downtown Development Commission warned that it was urgent for Livermore to revamp its central business district or else the “community would lose hundreds of thousands of dollars per year in sales tax and property tax revenues” when shoppers went elsewhere. One major proposal was to relocate the Southern Pacific Railroad tracks, create a retail complex, provide more parking, and generally beautify downtown.²⁴ The City Council eventually implemented these proposals, but not fully until the twenty-first century, and only after voters passed two expensive bond issues.

City leaders monitored the effects of growth and prepared accordingly throughout the 1960s. By 1966, Livermore’s Planning Administration provided detailed instructions to subdividers and developers who intended to submit plans to the City Planning Commission (requirements in the somewhat lengthy process included exhibits, maps, fees, and so on).²⁵ These requirements were at the behest of mostly labbers who were involved with the SAVE [Save All Valley Environments] movement, which would eventually be accused of making building prohibitively expensive in Livermore because of its credo policy that made prospective home-buyers pay for the cost of infrastructure

²³ John Shirley, conversation with the author, February 12, 2010.

²⁴ *A Plan for Downtown Livermore*, A Report of the Downtown Development Commission, 1969: 8; 1; 4; 47.

²⁵ *Land Development Guide*, City of Livermore, California, November, 1966, City Planning Administration.

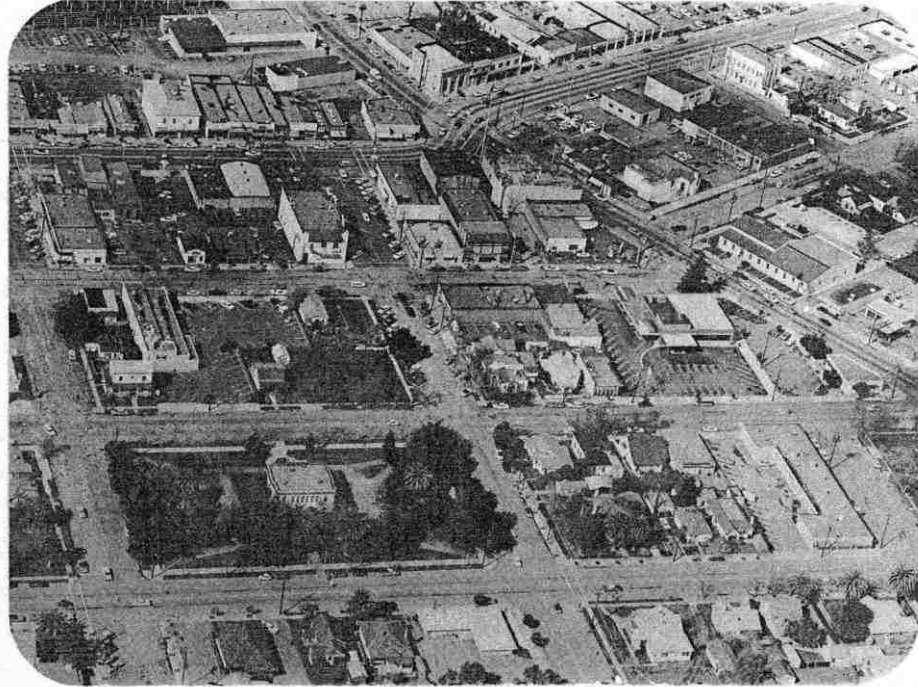
required for new developments. Don Miller became involved in the “growth wars” that began in the late 1950s when he was first elected to the Planning Commission in 1966. He later served on the City Council from 1968 until 1976. Based on seniority, he was appointed to the rotating mayoral position in 1973, and he asserted that his agenda was “the same as when I was a Councilman. I had a longer term vision of keeping this community a community...things like cultural organizations...and making the city more responsible to its citizens than to business.”²⁶

The newcomers appeared interested in making an investment in the city. For example, improving the quality of local education was crucial to the interests of the academically inclined parents who moved to Livermore to work at the lab. Lab officials collaborated with the Chamber of Commerce, local school district, and others to prepare a pamphlet that addressed the challenges educators faced. *Circa* 1963, it noted that 56 percent of the students in Livermore schools were “federally-connected children, which means that the local school districts receive substantial grants from the federal government for construction and maintenance of schools which saves the taxpayers thousands of dollars annually.”²⁷ But this financial incentive did not solve staff deficiencies in the valley. According to current Livermore resident Susan Canfield, “from 1967 to 1968 there was “a real pause for those who had teaching credentials,” because prior to 1967 teaching credentials beyond a bachelor’s degree were not needed in

²⁶ Don Miller, conversation with the author, February 11, 2010.

²⁷ *Livermore Facts*, Pamphlet developed cooperatively by the Livermore Chamber of Commerce, Lawrence Radiation Laboratory, Sandia Corporation, Livermore Laboratory, General Electric Vallecitos Atomic Laboratory, Livermore Joint Union High School District, and the Livermore School District, Unknown date (post-1962).

California. So there was a lack of teachers in California, and in Livermore. As a result, the city was “searching for teachers all over the world.”²⁸



This aerial view of downtown Livermore looks northerly, with Fourth Street and Carnegie Park (old City Library) in the foreground, and First Street at the top. The wide streets are prominent, with an intermingling of commercial and residential use.

Figure 16 An aerial view of downtown Livermore in the late 1960s shows the absence of a strong central business district. Residents encouraged development that would provide amenities within the city limits. (A Plan for Downtown Livermore, A Report of the Downtown Development Commission, 1969.)

This was another reason why Livermoreans were so concerned about growth at this time. Double sessions began in the 1960s. Even though many schools were built during the 1950s or later, some of these facilities shut down in the later 1960s “because of population issues...people with kids couldn’t afford to live near schools already built” and there was no school busing due to the relatively small size of the city.²⁹ Livermore not only suffered from the nationwide baby boom, but its federally-connected workers

²⁸ Susan Canfield, conversation with the author, June 4, 2009.

²⁹ As of 2010, there has yet to ever be any school busing in Livermore due to the city’s size.

worsened the situation by introducing an increased number of school-age residents. And many other groups were moving into Livermore in search of work, particularly minority groups that had previously either been few in numbers or completely absent. These changing demographics affected Livermore in the 1960s, especially during the Civil Rights Era.

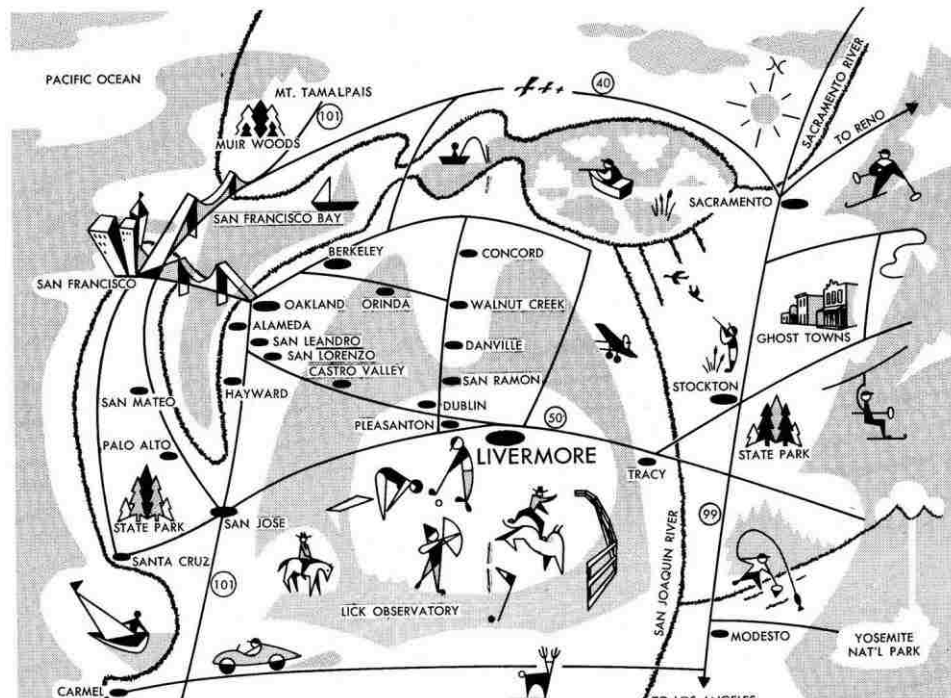


Figure 17 The proximity of leisure activities around Livermore and the Bay Area is highlighted in a brochure for newcomers in the 1960s. In contrast to Albuquerque, most lab workers did not need to be convinced that life in a small town would be desirable. In fact, they would later organize to maintain a “cowpoke” environment in the greater Bay Area. (Livermore Facts.)

As was the case in California and throughout the postwar West, Cold War defense spending created thousands of jobs for minority workers and, in the process, brought racial conflict to many communities that had never experienced it. The federal labs exacerbated the situation in Livermore whose residents were slow to welcome Asians, Hispanics, and African Americans. Don Miller recalled that while Asians had worked at the lab since its creation, the city’s white residents prohibited them, de facto, from living

in Livermore. Regarding African Americans, quite a few of whom worked at the labs and the city hospital, developers put up “Sold” signs on homes if they knew a prospective black family was looking to buy in the neighborhood. As late as the mid-1960s, Jim Crow reigned in Livermore. Mayor Shirley asked the City Council in July 1963 to approve a voluntary fair-housing ordinance to reduce racial discrimination and bank red-lining minority neighborhoods. At the same meeting, Councilman Milo Nordyke conceded, “Livermore does have a segregation problem, whether people are willing to admit it or not.” The *Livermore Herald* quoted the City Council’s consensus view that “housing in Livermore should be available to everyone regardless of race or color. Negro families who have the need, or desire, to live in Livermore, and having the ability to pay, have every moral and legal right to do so in America.” While this statement smacks of class bias, at least municipal leaders discussed a timely, somewhat contentious issue.³⁰ Shirley recalled that he “embraced the idea [of fair housing] and gave a talk from time to time about it” when he was mayor.³¹ Something had to be done following the violence in Birmingham and 1963 and the subsequent passing of the Civil Rights Act of 1964, which the federal labs would pressure their host cities to obey. However, the absence of significant minority populations in Livermore enabled civic leaders to overlook racial discrimination for quite a few years.

For example, in 1964, there were roughly ten African American families living in the city, but even with this small number, there was still resistance to the idea that those

³⁰ “Move To Find Negroes Homes Backed by City,” *Livermore Herald & News*, July 3, 1963.

³¹ John Shirley, conversation with the author, February 12, 2010.

who worked in the city should live there.³² In a somewhat confusing stance, “Negro attorney” Clinton White told the Inter Faith Committee for Fair Play in Livermore that “The high concentration of Negroes that has developed in West Oakland cannot grow up in Livermore” because, if those families moved to the city there was not a large supply of “older homes for them to be forced into,” presumably meaning that there was no affordable housing stock where African Americans could be segregated by the white majority.³³ Discrimination was still being fought in 1968. Finally, an organization formed in Livermore in 1969 comprised solely of minority group members to combat housing discrimination. Called the Concerned Minority Citizens of Livermore (CMCL), its main goals were to assist minorities and combat Jim Crow practices in the community.³⁴ Coalitions such as these were successful in eventually desegregating the town by the mid-1970s. Later movements, such as the slow growth movement, supported efforts to construct low-income housing, particularly for minorities, in Livermore.

Don Miller noted that the people, mostly labbers, in the slow growth movement were accused of making Livermore elitist or strictly white, a common complaint against the slow-growth movements that gained favor across the nation in later years. However, he retorted that they were actually the ones who supported desegregating the city to encourage a more diverse population. Miller attempted to establish the Human Relations Commission in the late-1960s, which would have given minorities a place to turn if they experienced discrimination in jobs, housing, or public places in town. Unfortunately,

³² “Negroes Live Here Now, But Many Still Opposed,” *Livermore Herald & News*, January 21, 1964.

³³ “White Says Oakland Can’t Happen Here,” *Livermore Herald & News*, January 21, 1964.

³⁴ Kenneth Becker, “Minorities Organize To Fight Valley Bias,” *Livermore Herald & News*, February 5, 1969.

voters defeated this proposal in a referendum. Miller said that when he went door-to-door to support formation of the Human Relations Commission, most people readily agreed to vote for it. But that “radical stuff was beneath the surface” and, in the end, many white residents never supported it at the polls.³⁵

At the same time minorities pushed for more equality in Livermore, other residents joined the slow growth movement. Following the protracted boom of the 1950s and 1960s, some residents began to question whether they could maintain an acceptable quality of life, one in which neighbors know each other’s names and big-box stores such as Wal-Mart do not dominate the landscape, if the city were to grow any larger. By the early 1970s, this widespread concern spawned a powerful grassroots movement that threatened to shut down development and put growth controls on Livermore. Between 1960 and 1970 the population sky-rocketed from 16,058 to 37,703. While the city was not included in the San Francisco-Oakland SMSA (which required a place to have 50,000 residents or more for inclusion) until 1980, Livermore was moving toward larger city status in the Bay Area. Still, traces of its past remained. For example, the population remained racially homogeneous, with only 172 African Americans living in town and a less than four percent foreign-born population. Finally, in 1970, Hispanics were classified as such and Livermore counted 3,615 people with a Spanish surname.

³⁵ Don Miller, conversation with the author, February 11, 2010.

	1960	1970
Population	16,058	37,703
Education Level	Median 12.6 years	75.5% completed high school
Professional Workers	1,548	4,023

Table 3 The population of Livermore jumped again between 1960 and 1970. Education levels and the number of professional workers also increased.

Many of the 1960 census trends in education continued. A substantial portion of men and women over the age of 25 had completed college, and the high school graduation rate continued to rise. Almost 14,000 people were employed in the city. Professional, technical, and kindred workers comprised 4,023 of this group, and within this category, thanks to the labs, there were 902 engineers.³⁶ Other large portions of the workforce labored in manufacturing and business as well as repair services. A substantial number of women (3,996) were professional or salaried employees or worked for the federal government.³⁷ Yet the city's growth slowed after 1972, due in large part to a community effort to maintain the small town atmosphere of Livermore. Obviously, rapid suburbanization strained city services. Expansion of the lab and population growth cost millions of dollars which offset the revenue gained from a larger tax base. The frenetic pace of expansion during the 1960s had concerned some citizens and led them to organize.

Residents were not uniformly concerned with Livermore's rapid growth, and certainly, amongst those who were troubled, there was not unanimous agreement on what

³⁶ 1970 Census of Population. *Part 6. California. Section 1. Volume 1. Characteristics of the Population.* United States Department of Commerce. Issued April 1973: 6-13; 6-219; 6-370; 6-906; 6-791; 6-370; Out of males 25 or older (9,413), 2,440 completed college and out of females 25 or older (9,638), 1,296 completed college; 6-829.

³⁷ *Ibid.*, 6-810.

steps to take. However, after a decade of campaigning on behalf of slow-growthers, controls were put on further development in Livermore. Leading the way was a coalition of concerned citizens called SAVE—Save All Valley Environments—and its members were concerned about sewage capacity, water supply, air pollution, and over-crowded schools. SAVE activists felt that the city council was not doing enough to regulate development, so it embarked on a political campaign, and eventually even got some of its members elected mayor. Under pressure from mostly “newcomer” residents who were concerned that Livermore lacked the resources and infrastructure to sustain rapid buildup, they passed the SAVE Initiative in 1972, which limited growth, such as the issuance of building permits, to two percent annually. As a result, over the course of the 1970s, the town’s population increased by less than 12,000 people, a dramatic contrast to the previous two decades.³⁸

Don Miller admitted that the initiative could be construed as somewhat elitist, because “it was a result of educated newcomers coming here [and] that a group of people recognized what could happen [if growth were not managed].” Still, Miller believed that the SAVE Initiative did the city a favor. While he acknowledged that sometimes growth means progress, what was happening in Livermore was “not really progress.”³⁹ Helen

³⁸ Gary Drummond, city historian, unpublished materials, Livermore Heritage Guild; “Group seeks growth limit support,” *Herald News*, November 25, 1971; Many cities later initiated slow-growth movements and imposed restrictions on expansion, such as urban growth boundaries. While Santa Barbara, California and Boulder City, Nevada, have older initiatives, dating from the 1970s, movements in Portland, Oregon and Boulder, Colorado occurred in the late-1980s and early-1990s, much later than the one in Livermore. However, one apt comparison to Livermore’s slow-growth movement would be to the imposed growth policies of Bolinas, California. In Bolinas, a rural enclave north of San Francisco in Marin County that boomed in the 1950s and 1960s, much like Livermore, residents started a grassroots, environmental movement to restrict further growth and “keep this beautiful slice of Marin a secret for as long as possible.” Andrew Kirk, *Counterculture Green: The Whole Earth Catalog and American Environmentalism*, (Lawrence, Kansas: University of Kansas Press): 24.

³⁹ Don Miller, conversation with the author, February 11, 2010.

Tirsell, the first woman elected to the City Council, Livermore's first female mayor (1976-1978), and herself a recent arrival, agreed with Miller. "When you do the math," she said, "when you put a house in and need amenities for health and safety, the houses don't add to prosperity for the city." As a teacher and highly educated woman, Tirsell saw overcrowding in schools as reason alone to slow growth in Livermore, because "we were growing a grade school every year, and it was a disaster...we also had terrible smog." For Tirsell, slowing growth was a necessary "revolution," although some of the oldtimers had mixed or even outwardly hostile reactions to newcomers such as her. "We invaded this town, this cowboy town," she declared. "I was suspect. I was told that I ruined their town." Nevertheless, she was proud to have supported the slow growth movement, because she felt that the city's quality of life was preserved.

Tirsell recalled that McDonald's wanted to put a huge twirling sign atop its restaurant, but residents successfully opposed the move, which they believed would disrupt the skyline. She remembered one Bay Area Chamber of Commerce member sarcastically asking those who were against the sign: "Where do you think you are, *Carmel*?"—because that was the only other city that had successfully thwarted billboards and neon signs within its limits. This was a victory for Livermore, Tirsell concluded, and residents were able to "keep a cowboy look and redo the buildings to make it look like it was the same as it was at the turn of the century...that was by design." Tirsell continued, "We fought against all those heritage homes from being torn down, trees from being cut down...we wanted our town to look good, smell good, be good." Ultimately, she felt that the efforts of the SAVE supporters were successful. "The proof is when you hit the end of Pleasanton [arriving in Livermore] and you look out at the hills and the valley. We did

it.”⁴⁰ Although one home was built on the top of an otherwise undeveloped, green hill, for the most part the natural scenery remains.

Even today, this group occasionally raises new objections, as officials consider more construction projects. According to Miller, after 1972, SAVE proponents tended to be the majority on the City Council, although this dominance “came and went.” Helen Tirsell recalled that “while we had many battles, I always appreciated that Don took the hard left [that is, the no growth stance instead of slow growth]...he was resilient” and he “probably made left of center seem more reasonable.”⁴¹ Gary Drummond worked at the Sandia Corporation in Livermore for 42 years and currently serves as the city historian. In the 1970s, according to Drummond, the city was short of water and buildings, and there was a feeling among residents that “we don’t want to be an urban community, we’re too close to San Francisco already.”⁴² According to Canfield, “The labbers were really the ones who were involved in SAVE. Of course, I don’t want the urban sprawl like you see in Dublin [California].” Drummond agreed, “I am a strong proponent that we need open space.” Indeed, one of SAVE’s main goals was to increase minimum lot sizes to decrease the appearance of a “slurb”-like landscape.⁴³

To be sure, it was mainly the labbers who started SAVE and insisted on zoning reform. Don Miller recalled that “we argued for small lots, small houses...we worked on this while I was on the Planning Commission...and there was nothing radical about that except to the developers and their sycophants and the City Council.” Miller described

⁴⁰ Helen Tirsell, conversation with the author, February 12, 2010.

⁴¹ Ibid.

⁴² Gary Drummond, conversation with the author, June 2, 2009.

⁴³ Susan Canfield, conversation with the author, June 4, 2009; Greenberg, 280.

how residential developers argued that they could not build affordable housing unless they were allowed smaller lot sizes. But Miller noted that when developers were granted small lot sizes, they built them up to be more profitable. “You knew they were lying,” he later said, “since the moment they opened their mouths.”⁴⁴ To illustrate the importance of larger lot sizes and smaller homes, Miller recalled a City Hall meeting in the 1960s during which “one of the guys from the lab said: ‘I don’t like being so close to my neighbor that I can reach out my window and flush his toilet.’” Helen Tirsell had a similar anecdote to share, “You sneezed and your neighbor would hear you.”⁴⁵

Of course, not everyone agreed with the “slow-growthers.” In 1973, Don Shoecraft, urban affairs writer for the *Tri-Valley Herald and News* denounced the work of SAVE, in particular its overwhelming support for its ballot measure that aimed to stop growth. He wrote that “Historians, if they ever look back to record the 1971-1972 period in Livermore and Pleasanton, must record that developers, frightened by the possibility of an impending moratorium on building permits under SAVE, made a rush on those permits that were available—thus boosting the number issued to about twice normal—but that no permit was ever denied in those two cities based on SAVE.” Enraged, Shoecraft wrote a four-day series of columns denouncing SAVE not only for stopping homebuilding but also for frightening developers away from the city.⁴⁶ He also complained that Livermore had been denied state money to upgrade its sewage plant and that California leaders began to prefer supporting development projects outside of

⁴⁴ Don Miller, conversation with the author, February 11, 2010.

⁴⁵ Helen Tirsell, conversation with the author, February 12, 2010.

⁴⁶ Don Shoecraft, “SAVE never stopped growth,” *Tri-Valley Herald and News*, July 23, 1973.

Livermore.⁴⁷ In addition, “Sale of land and prices paid for what is sold—that weatherwave of developer spirits—have plummeted,” Shoecraft complained. “That appears as the only substantial effect of the ‘city attitude,’ the ‘SAVE psychology,’ the ‘stop-growth movement,’ or whatever name you choose to attach to what happened in the Tri-valley during the last two years.”⁴⁸

Shoecraft was not alone in criticizing idealistic SAVE supporters. In 1974, the *Los Angeles Times* reported that the city of Livermore was “charged by a builder in Northern California with actions designed to control growth and exclude people from the city by unconstitutional ordinances and fees.” The fees referred to included a \$3,000 per residential unit fee and an \$800 per unit school fee, which critics might have argued would disenfranchise prospective homebuyers.⁴⁹ Simultaneously, although some valley residents charged that SAVE “strangled” Livermore’s growth, most homeowners saw their property values rise.⁵⁰ Even today, while housing prices nationwide have dropped in since 2006, the relative scarcity of homes in Livermore has made the impact there less severe. But that was not the point, according to SAVE supporters. Miller felt that “residential development does not pay its way anywhere. Residential development doesn’t do your community any good, especially when you consider the environmental

⁴⁷ Don Shoecraft, “State Actions rendered developers sad,” *Tri-Valley Herald and News*, July 25, 1973.

⁴⁸ Don Shoecraft, “The law is at the same time most simple, most complex,” *Tri-Valley Herald and News*, July 26, 1973.

⁴⁹ “Livermore Accused of Restricting Growth,” *Los Angeles Times*, October 6, 1974.

⁵⁰ Don Shoecraft, “SAVE impact more than physical effect,” *Tri-Valley Herald and News*, July 24, 1973.

costs.” He argued that the costs of new housing should be included in the prices of homes, a position generally rejected by the Chamber of Commerce and developers.⁵¹

Despite this contention, other people regarded SAVE as a destructive influence. Steve Kious opposed the moratorium on house-building, reporting in the *Tri-Valley Herald* in January 1977 that controlled housing was not the way to control growth, because the children in current families would eventually need homes of their own. He concluded that even if there were no population increase, there would still be a need for housing, and he urged engineers at the labs to make local government officials aware of this fact.⁵² But locals vowed to keep their town a “town” by any means necessary. Don Miller argued that Livermore had become a commuter city in the Bay Area, so the idea that kids would not have a place to live made no sense, dismissing the growth advocates’ position as “a false argument.”⁵³ Still, Shirley remained pro-growth, declaring that “the slow-growthers seem selfish to me,” and adding that if residents would have simply agreed to pass bonds to pay for expanded schools and infrastructure, the city would not have needed to stop or slow growth. In fact, he asserted that “if growth is planned and well done, I have no problem with it because when a strong enough base of people supports growth, then it should happen.”⁵⁴ But Helen Tirsell argued that “voters weren’t going to pass bonds...why should we pay for kids from over the hill [commuters]?”⁵⁵ The town was split.

⁵¹ Don Miller, conversation with the author, February 11, 2010.

⁵² Steve Kious, “Housing called the key to growth,” *Tri-Valley Herald*, January 21, 1977.

⁵³ Don Miller, conversation with the author, February 11, 2010.

⁵⁴ John Shirley, conversation with the author, February 12, 2010.

⁵⁵ Helen Tirsell, conversation with the author, February 12, 2010.



Figure 18 The Carnegie Building houses the Livermore Heritage Guild and History Center, as well as an art gallery. The Guild saved this historic building from demolition, and is currently situated in a public park that provides both recreation and scenery to nearby downtown. Photo taken by the author June 4, 2009.

Of course, not all urbanization proposals were popular. Supporters of historic preservation founded the Livermore Heritage Guild (LHG) as a non-profit organization in 1973 in response to concerns over the proposed demolition of Livermore’s Southern Pacific depot. The organization succeeded and the train depot’s restoration began in May 1974. Since its inception, the Guild’s newsletters have emphasized preservation and restoration of historic sites, its slogan being “Help save yesterday for tomorrow!”⁵⁶ Over the past four decades, the Guild members have fought to keep Livermore small; for example, they opposed the widening of downtown’s L Street in part because “it would

⁵⁶ *Livermore Heritage Guild Newsletters Collection*, February 1973, The Bancroft Library, University of California, Berkeley; *Livermore Heritage Guild Newsletters Collection*, June 1974, The Bancroft Library, University of California, Berkeley; *Livermore Heritage Guild Newsletters Collection*, October 1973 – October 1985, v. 1-12, The Bancroft Library, University of California, Berkeley.

encourage fast automobile traffic through the heart of the City.”⁵⁷ So, as would later occur in Portland, Denver, and other western cities, feverish growth in Livermore inspired separate slow-growth and historic preservation movements as well as a pro-growth coalition consisting of promoters, bankers, developers, realtors, and builders. The latter group’s claim is that the slow-growth advocates have damaged Livermore’s ability to capture more federal funding and improve its access to the Bay Area attracting BART service.⁵⁸ However, this does not mean that they resigned themselves to protracted slow-growth. As geographer Douglas Greenberg observed, “With considerable land still available for construction so close to the burgeoning East Bay, a slow-growth future was by no means accepted as a *fait accompli* by members of the business and land development communities.” But he also noted that “a series of attempts to abolish the two percent growth rate limit in Livermore [were] met only with frustration.”⁵⁹ Yet Don Miller still fears that “people may get tired” with slow growth.⁶⁰ For better or worse, the end result was that Livermore *has* remained a small town, and none of the population growth predictions of the 1960s came true. This conflict in Livermore is noteworthy because it was mainly supported by lab personnel, well-educated sophisticates who brought values of land-use planning and maintenance of a community atmosphere to their new home in Alameda County. It is improbable that a different demographic of residents would have fought for slow-growth when the majority of urban citizens in the West equated expansion with progress.

⁵⁷ *Livermore Heritage Guild Newsletters Collection*, May 1977, The Bancroft Library, University of California, Berkeley.

⁵⁸ Susan Canfield, conversation with the author, June 4, 2009.

⁵⁹ Greenberg, 371; 455.

⁶⁰ Don Miller, conversation with the author, February 11, 2010.

Full Speed Ahead

Amidst all this tumult, the Livermore Lab continued to prosper. In 1971 it gained its independence from Berkeley, partly due to student protests against nuclear weapons development. However, it did continue to be managed by the University of California. In recognition of the Lab's accomplishments, Congress designated it a national laboratory in 1980.⁶¹ It was obvious long before this honor was bestowed that the facility had a bright future. In 1972, AEC Chairman Dr. James R. Schlesinger spoke to a local crowd at the lab's twentieth anniversary and assured everyone that "programs at Livermore such as controlled thermonuclear research, biology and environment and the promising effort on laser-fusion" would keep the LLNL busy for years to come. "Whatever the future portends," he declared, "be it diminishing rivalries and an era of international stability or something else—the Livermore Laboratory...will continue to have a productive role to play." Apparently the AEC knew that diversification had to occur at all of its nuclear weapons facility holdings, including LLNL, Los Alamos National Laboratory, and the Sandia Corporation.⁶²

In a 1978 *Washington Post* article, Walter Pincus reported that Livermore was the clear winner (over Los Alamos) in acquiring more of President Jimmy Carter's defense budget, which included development of "high-energy lasers and particle beams that some have dubbed 'death rays.'" The article reviewed the histories of both laboratories, pointing critically to when the Russians dropped the three-year moratorium on testing in

⁶¹ Barton Hacker, "A Short History of the Laboratory at Livermore," *Science & Technology Review*, Regents of the University of California, (September 2008): 18; Today's name for the Lab (and a name used throughout this paper even in time periods before it was designated so) is Lawrence Livermore National Laboratory

⁶² Earl Biederman, "'LLL to play role in U.S. future,'" *Herald News*, September 22, 1972.

1961 and President Kennedy ordered testing to resume in the Nevada desert and the Pacific, only to have fallout contaminate Utah's milk supplies. Pincus mentioned this because both labs in 1978 claimed to aspire to "clean" fusion explosions and nuclear energy. According to Pincus, Livermore was known as the "City of Death" in the Soviet Union, perhaps due to the number of new weapons systems (five) the Lab was designing for the Pentagon. He added that "Livermore has appeared confident that it would get the nod on the MX warhead... Los Alamos officials say the award of the MX to Livermore would be no surprise to them." However, the Department of Energy historically divided projects between the two labs, and Los Alamos expected to (and did) get the contract for developing the Trident II missile. As Pincus noted, "To survive now, both labs devote half of their budgets, which both run nearly \$300 million a year, to non-weapons activities such as energy and health research."⁶³

Like Los Alamos and Sandia, Livermore changed with the times, making transitions from Hot War to Cold War to peacetime. LLNL participated in the Department of Energy's Stockpile Stewardship Program by "making major investments in advance computation and nonnuclear testing." This involved being a vital part of the Accelerated Strategic Computing Initiative "to increase massively parallel computation power for virtual analysis of the aging stockpile verified by past nuclear test data and nonnuclear experiments."⁶⁴ Sandia, meanwhile, continued its record of giving back to its host community in Livermore just as it did in Albuquerque. In September 1985, the Livermore Heritage Guild newsletter reported that the group received a donation from

⁶³ Walter Pincus, "2 Labs Battle to Be No. 1," *Washington Post*, December 12, 1978.

⁶⁴ Hacker, "A Short History of the Laboratory at Livermore," 20.

Sandia Corporation to be used toward city restoration projects.⁶⁵ One of the city's principal employers kindled community solidarity.

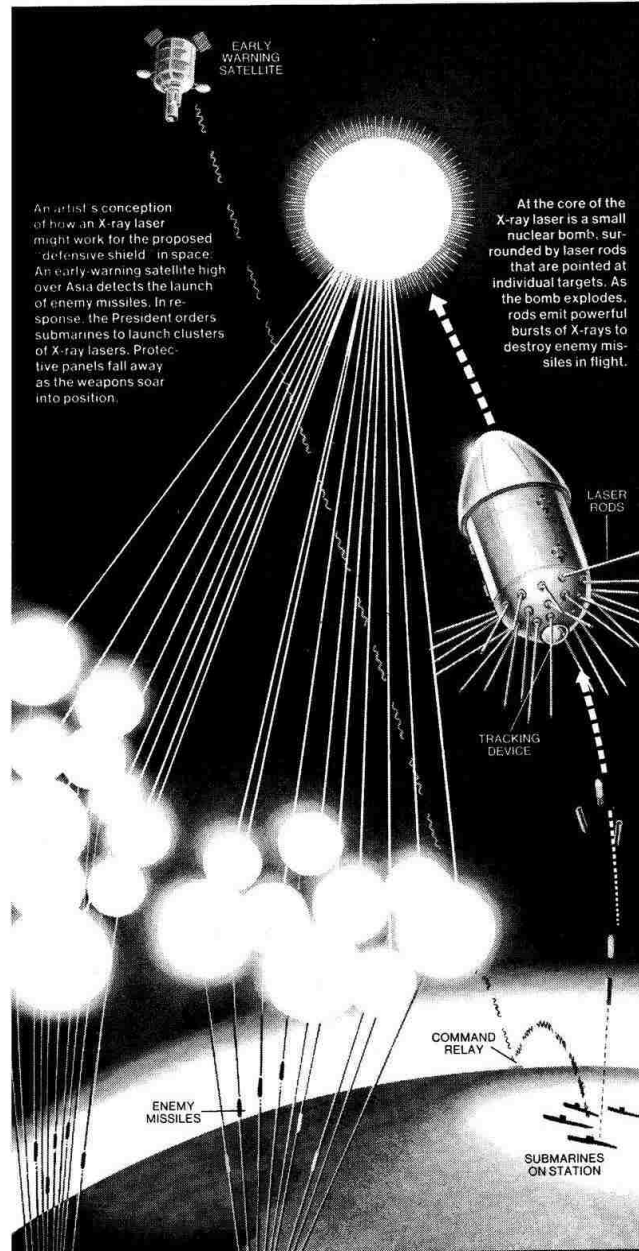


Figure 19 This undated artist conception of how an x-ray laser might create a "defensive shield" in space is most likely from the time of the Reagan administration. Projects such as these would have boosted the importance of Livermore Lab in the context of national defense. Courtesy Livermore Heritage Guild.

⁶⁵ *Livermore Heritage Guild Newsletters Collection*, September 1985, The Bancroft Library, University of California, Berkeley.

In 1972, yet another industry appeared in Livermore—Intel. This was Intel’s fourth plant and it soon employed up to 300 workers. It was undoubtedly lured by the lab’s presence, because some of its chip production workforce went to supply Sandia and LLNL.⁶⁶ Promoters in the 1970s hoped that Livermore’s isolation and still relatively cheap land might draw other businesses away from Silicon Valley. By the early 1970s, although SAVE members were accused of threatening this dream, boosters were not disappointed. While the Livermore Chamber of Commerce did not draw many new businesses to the city, , several thousand residents made the 25-mile plus trip to Silicon Valley, San Francisco, and other Bay Area cities daily. This trend irked those who were concerned about air pollution, and SAVE supporters pressured city officials to limit more housing in the effort to prevent Livermore from becoming a full commuter suburb such as neighboring Dublin and Pleasanton. According to Miller, “There were terrific fights over residential development, but everyone agreed that we weren’t opposed to industry...the problem was that places like Dublin/Pleasanton had rail close by.” Still, the slow-growth city council was labeled by their opposition as being against attracting industry. Miller felt that “we took beating...like it was all the council’s fault for driving away industry” because of the slow growth movement, and the rumor persisted that there would be nowhere to house workers in Livermore if a business were to go to the town.⁶⁷ Thus, as far as jobs were concerned, the Labs remained the primary industry for the town. While SAVE advocates pushed for a balanced job to house ratio, the roughly 10,000

⁶⁶ “Electronics Firm to Build Here,” *Herald News*, October 6, 1972.

⁶⁷ Don Miller, conversation with the author, February 11, 2010.

employees of LLNL and Sandia were not nearly balanced with the population of approximately 75,000 in the twenty-first century.

In the early 1980s, the Labs continued to receive a significant number of defense dollars, and the position of Livermore in nuclear weapons research was less guarded. A *New York Times* article that year revealed how the “power hitters [warheads] in America’s strategic stockpile, were all conceived on the outskirts of Livermore, Calif., a cowtown-turned-suburb 42 miles east of the Golden Gate Bridge.” The reporter also noted that while California Governor Edmund G. Brown Jr. unsuccessfully pressed the University of California to sever ties with both Livermore and Los Alamos due to his moral disagreement with the nature of their research, the Labs’ lobbying power remained strong. For example, former Livermore scientists who went on to work for the Pentagon, Department of Defense, and Department of Energy successfully killed the Carter Administration’s Comprehensive Test Ban Treaty in 1978, leading the reporter to quip that “The fox...is guarding the coop.” The article further noted that developments at Livermore during the Reagan years were sure to prove “full steam ahead” for “Star Wars” research, with almost \$250 million of Livermore’s budget being dedicated to defense programs in 1981.⁶⁸

The lab’s success was good for Livermore because of the local supply business the facility generated and because most lab employees continued to reside in the city, both of which contributed multiplier effects upon the local economy. But it did not last. By 2000, only about half of the lab’s employees still lived in the city. Many lower-paid technicians had migrated farther east, while some scientists and engineers had moved to

⁶⁸ Stewart McBride, “New Life for Nuclear City,” *New York Times*, January 18, 1981.

the more upscale community of Pleasanton, which possessed many amenities and sat closer to Silicon Valley and a convenient rail line.

For much of the Cold War era, Los Alamos National Laboratory and Lawrence Livermore National Laboratory together employed six percent of American physicists. Some critics insisted that these scientists had to work in weapons labs due to scarcity of work in their fields; however, in anthropologist Hugh Gusterson's survey, most employees claimed to have personally chosen the lab, mainly because of their disdain for university work. At the lab, they could conduct basic, or non-applied, research without having to teach undergraduates or endure the pressure to publish.⁶⁹ The opportunities also attracted more female scientists, as women earned more advanced graduate degrees in the 1970s than in previous decades when gender discrimination was more the rule than the exception. Pressure from the Carter Administration, the DOE, and the EEOC prompted all federally funded labs to encourage more qualified female scientists to apply.

This was no easy process for the labs, nor was it easy for women to enter a research area that was long the domain of men. Tom York began his 1974 *Tri-Valley Herald* article in a condescending tone by asking, "Can a woman do a man's job?" He explained this seemingly chauvinistic question by reporting that because of Affirmative Action, the Livermore Lab was looking to hire more female scientists and engineers, although finding candidates was often "all but impossible." Of the 5,000 or so positions at the Lab, women accounted for about 700, and they were not all better-paying, technical jobs. York blamed this discrepancy on the fact that only one percent of all graduating physicists in the nation were women. However, LLNL Representative Karol Ruppenthal

⁶⁹ Hugh Gusterson, *Nuclear Rites: A Weapons Laboratory at the End of the Cold War*, (Berkeley: University of California Press, 1998): 18; 43; 46.

contacted academically talented women in high schools and colleges to spark interest in the field.⁷⁰ And Dr. Claire Max, a plasma physicist at LLNL, encouraged women to enter scientific fields and not be discouraged. She declared that “it’s becoming clearer that when [women] do take science courses, they get just as good grades, but girls have a higher attrition rate.” Although Max often worked in the company of men at LLNL, she insisted that it never affected her determination or performance.⁷¹ Helen Tirsell acknowledged the archaic, unspoken “impression that women were not smart,” but contended that it just inspired her and other women to work “four times as hard.” She remembered that despite cutting-edge research being conducted at Livermore in the 1970s, it was still a bastion of traditional culture, and women were expected to remain at home. However, she said that “even though I was the first woman [mayor], I was not discriminated against...I was pleasantly surprised.”⁷²

For all the positive effects the lab had on the city, it was also a site of controversy. Like the Nevada Test Site, the Livermore Lab was the target of anti-nuclear protests. Pete Winslow, a local reporter, noted in a 1971 article for *The Nation* that lab scientists kept silent about issues such as radioactive fallout, which led to Project Plowshare coming under increased scrutiny.⁷³ The Project, initiated at Livermore by the AEC in 1957 to investigate peacetime uses of nuclear energy, was credited in a 1958 article in *The Nation* for derailing negotiations in Geneva. According to the author, University of Washington

⁷⁰ Tom York, “LLL has jobs for women,” *Tri-Valley Herald*, May 6, 1974.

⁷¹ Charan Wollard, “She’s getting women into science,” *Tri-Valley Herald*, March 27, 1978.

⁷² Helen Tirsell, conversation with the author, February 12, 2010.

⁷³ Pete Winslow, “Fallout from the ‘Peaceful Atom,’” *The Nation*, Vol. 212, Issue 18, May 3, 1971, pp. 557-561.

physics professor E. U. Condon, it soon became obvious at the bargaining table that the superpowers distrusted limited nuclear testing for supposedly peaceful purposes. Since there was no definite way to verify this motive, negotiations broke down until everyone agreed to cease all testing. Condon therefore proposed that the United Nations oversee civilian uses of nuclear explosives, which would appease everyone and possibly speed knowledge acquisition.⁷⁴ However, the moratorium went into effect in 1958 and lasted three years. Testing resumed in 1962 and continues in China and other countries to the present day. Moreover, the United States never felt obligated to answer to the United Nations or any power for its continued nuclear testing and growing arsenal of weapons. Throughout the Cold War, America adhered to its 1950s policy of deterrence through nuclear build-up.

But by 1982, critics of the Reagan administration's defense spending made a convincing argument that rearmament was a "qualitative step toward nuclear war." In *The Nation*, Kerry O'Banion, an environmental policy analyst at the Livermore Lab, pleaded for the administration to reconsider its actions before the nation found itself "in a world permanently on the brink of nuclear holocaust."⁷⁵ Marcy Darnovsky noted in a later article that Livermore had reaped benefits from the arms race as well as the energy crisis, because it also had been working on laser fusion and magnetic mirror fusion, both of which could play vital roles in future energy production. However, she complained that only a "relatively minuscule portion of its [Livermore's] budget goes for fossil fuel,

⁷⁴ E. U. Condon, "Bombs-For-Peace Hypocrisy," *The Nation*, Vol. 187, Issue 17, November, 22, 1958, pp. 376-377.

⁷⁵ Kerry O'Banion, "What It Really Means to Push the Arms Race," *The Nation*, Vol. 234, Issue 12, March 27, 1982, pp. 366-368.

solar and wind research.” She even warned of the lab’s threat to the health and well-being of Livermore’s residents and those in surrounding areas. She devoted much of her article to the potential accidents (whether they be accidental or due to forces of nature, like earthquakes) that might occur at Livermore and jeopardize many California lives with escaping radiation. She noted that controversy had already erupted over the unusually high cancer rate among employees at Lawrence Livermore, even though workers never responded publicly to this fact. Darnovsky also declared that the “health hazards posed by the leaks and dribbles from Lawrence Livermore pale next to the Armageddons being stored up there,” a reference to the 600 to 800 pounds of plutonium that were (and possibly still are) routinely stored at the site.⁷⁶

Other citizens also raised concerns about the stockpiling. As Norris Bradbury of Los Alamos National Laboratory said, “If you have a bomb that will destroy ten cities, there isn’t much point in exploding a thousand such bombs. There aren’t that many vital centers.” This led one journalist to ask rhetorically, “But even if your enemy did have 10,000 vital centers, could you risk H-bombing all of them in any short period of time? The problem of poisoning the atmosphere with radioactive particles, and having them come home in ‘fall-out’ might very well arise from such an attack.”⁷⁷ Already back in the time of Site 300, a small test site established in 1955 to the east of Livermore, protesters echoed this sentiment. One of the first instances of citizen backlash was an “education demonstration” organized by Richard Kramer of Modesto, California for November 24,

⁷⁶ Marcy Darnovsky, “Building the U.S. Arsenal,” *The Nation*, Vol. 234, Issue 22, June 5, 1982, pp. 671-689.

⁷⁷ Relman Morin, “Lab Chief at Los Alamos Hints New Atom Weapons,” and Elton C. Fay, “U.S. Reportedly Can Drop A-Bombs ‘On a Dime,’” Unknown newspaper clipping, 074092, Ernest O. Lawrence papers, BANC FILM 2248/BANC MSS 72/117 c, The Bancroft Library, University of California, Berkeley.

1957 to protest nuclear weapons testing at Livermore. The same group held demonstrations after atomic tests in Nevada.⁷⁸ Livermore experienced a number of protests against nuclear weapons development and testing from that time onward. But the city drew many less protestors than at the Nevada Test Site. Most Livermore demonstrations only required the deployment of city police.

Local residents were generally not sympathetic. In one of the largest protests ever at Livermore in May 1979, locals hardly responded to the chants of 4,000 demonstrators. A few were interviewed inside a bar during the action; some did not care what was going on; others did not even know what was taking place; and still others denounced the demonstrators. Pat Craig of the *Tri-Valley Herald* reported one man in the bar shouting: “They oughta drop H-bombs on all the demonstrators. They oughta drop bombs on anybody who does stuff like that.” Overall, Craig reported, the demonstration had little or no impact on the town. Residents spent that Saturday doing the things they typically did, such as buying food, driving around, and riding bikes. A barber on First Street, Richard Fuller, was quoted as saying, “I’ve seen a few people headed out to the lab. You know, a lot of people depend on the lab for their living. It’s given us a good living.”⁷⁹ At least in terms of the research being conducted, the oldtimers and newcomers shared a consensus. The same was true in Las Vegas, where the occasional protest pilgrimage of ministers, nuns, priests, and celebrities like astronomer Carl Sagan barely drew a yawn from casino

⁷⁸ “Nuclear Protestors To Converge Here,” *The Livermore News*, October 29, 1957.

⁷⁹ Pat Craig, “Prophets of nuclear doom don’t impress lab neighbors,” *Tri-Valley Herald*, May 6, 1979; Constandina A. Titus, *Bombs in the Backyard: Atomic Testing and American Politics*, (Reno & Las Vegas: University of Nevada Press, 1986).

employees, Test Site workers, and other residents. According to former mayor Shirley, “most people ignored it...it wasn’t a big deal.”⁸⁰

Overall, the 1960s and 1970s were a tumultuous time for Livermoreans. Continuous growth had sparked the SAVE initiative, which partially limited growth, much to the horror of developers. Civil rights and an increased minority presence had to be addressed both by natives and the city government. At the same time, the lab continued to thrive and help drive the city’s economy, while its weapons research activity came under fire from anti-nuclear activists. Still, Livermore would become a useful model for cities threatened by uncontrolled expansion and aggressive developers, many of whom, in later years, wanted to maintain their pastoral values. Livermore had engaged in “growth wars” before many other cities in the West had considered expansion to be anything but a positive event. Yet while Livermore continued to wrestle with numerous policy issues and some community conflict in the 1970s, it had adjusted to science-driven growth and minority demands for equality while preserving some of its small-town atmosphere and quality of life.

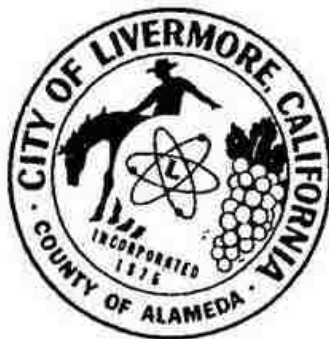


Figure 20 The Livermore city seal indicates its notoriety in both oldtimer and newcomer culture, emblazoned with a rodeo sketch, grapes, and an atomic symbol.

⁸⁰ John Shirley, conversation with the author, February 12, 2010.

On the other hand, while Albuquerque's experience with a nuclear weapons facility paralleled Livermore's in many ways, boosters in "Duke City" took advantage of the introduction of the Sandia Laboratory in the late 1940s to transform their city into a metropolitan area open for business and eager for growth. A comparative look at the paths of these two cities offers further insight into how Livermore diverged and distinguished itself from other martial cities in the West.

CHAPTER 4

ALBUQUERQUE: SIMILARITIES AND CONTRASTS

Just as introduction of a weapons lab transformed Livermore in some significant ways, when the Sandia Laboratory opened in Albuquerque, it also changed the economic geography, demographics, and future of its home city in the postwar years and thereafter. While Albuquerque's lab began operating almost a decade before Livermore's, as in the small California town, the construction and expansion of the Sandia Laboratory during and after World War II drew thousands of educated newcomers, creating an instant housing shortage.¹ After 1950, the growing presence of Sandia, nearby Kirtland Air Force Base, and the huge technological complex that emerged on the desolate foothills of the Sandia Mountains thrust Albuquerque northeastward in a new direction. Over time, this wave of suburbanization set the precedent for a northward building trend that, by the 1970s, would spill northwestward from Bernalillo into neighboring Sandoval County. It all began with Sandia. The so-called "science suburbs" of the 1950s and 1960s gradually filled the "Northeast Heights" with a new population of white-collar, upper-middle-class families and individuals that made Albuquerque a dynamic, modern city characterized by scientific research, higher education, and a strong federal presence. Local boosters used the introduction of the Lab to portray the Duke City as a diverse metropolis, welcoming industry and growth.²

¹ It should be noted, however, that while the introduction of the Sandia Lab and the corresponding influx of workers to Albuquerque certainly added to the expansion of the city, this draw was only one part of a far larger and more complicated population movement westward, a trend whose description is beyond the scope of this paper.

² "Duke City" is a nickname for the Albuquerque that harkens to the Spanish Duke of Alburquerque for whom the town was named. The first "r" in Alburquerque was eventually dropped from the city's name, as it was difficult to pronounce for some. For a more detailed account, see Erna

Origins of Albuquerque's Sandia Lab

Modernization, the addition of twentieth-century conveniences, marked a dramatic break with the past. Indeed, Albuquerque's origins resembled those of many other southwestern towns that were roused from their nineteenth century slumber by the arrival of a transcontinental railroad. The Atchison, Topeka & Santa Fe Railroad entered the old Spanish pueblo in 1880 and rapidly turned the historic outpost into a city. The Santa Fe attracted industry, while bringing jobs and population.³ The railway constructed its tracks and depot two miles from Old Town, the original Spanish plaza, to promote development of what is today Albuquerque's "downtown."⁴ Still, the city remained small and predominately dependent on blue-collar industry. A turning point came in 1926 when the Federal Aid Highway Act of 1921 funded U.S. Highway 66, which bisected Albuquerque and served as a link between the predominantly rural West and the urban Midwest and Northeast. "Route 66," as it came to be known, increased out-of-state traffic through town. This highway, in turn, led to the growth of a roadside economy around Albuquerque and economic prosperity within the city itself.⁵

Fergusson's charming portrait of Albuquerque in 1947 in her book *Erna Fergusson's Albuquerque* (Albuquerque: Merle Armitage Editions, 1947).

³ Arch Napier, "City of Surprises: Albuquerque," Sandia Corporation Brochure, Albuquerque, NM, No Date.

⁴ Wade Patterson, "The Rise of the Regional City," *New Mexico Historical Review*, 82 1, Winter 2007: 5.

⁵ Howard Bryan, *Albuquerque Remembered*, (Albuquerque: University of New Mexico Press, 2006), 228; It should be mentioned that I have not tried to do justice to the long and complex history of Albuquerque in this thesis, as such a task has been attempted by far more qualified scholars than myself in monographs dedicated to the subject, many of which are cited in this paper. In fact, hardly any books on Duke City could claim to be comprehensive, as Albuquerque is not only one of the oldest places colonized by Europeans in what would later become the American Southwest, but in the entire United States. While in Livermore "oldtimers" met "newcomers," in Albuquerque it must be emphasized that it was a different case, in so much as the *really* old met the *really* new.

Yet despite both the railway and Route 66, prewar Albuquerque was basically the same town it had been since the late-nineteenth century⁶ The next transition toward urbanization occurred when a few entrepreneurial Santa Fe Railway employees on the East Mesa opened the city's first airport, a private venture, in 1928, which drew new attention to Albuquerque—a logical mail and refueling point between Kansas City and Los Angeles. The U.S. military also took notice of the airport.

In 1941, the army acquired the land next to the airport and converted it into a training facility for bomber pilots. During World War II and the Cold War, focus shifted from the railroad yards and downtown Albuquerque to the Kirtland Air Base and the Albuquerque depot for Los Alamos—Sandia Labs.⁷ A strong military training presence and related national defense facilities led to unprecedented growth in Albuquerque during World War II. The Army Air Corps added Kirtland Field to its holdings in 1942, and later acquired an additional eleven hundred acres adjacent to the east of the base, including the privately owned Oxnard Field. This land ultimately housed a training center for aircraft mechanics and air depot personnel. While the new facility was referred to unofficially as Sandia Base, the name did not become official until 1945.⁸

The government had been searching for a place to move part of its Los Alamos operations (the Z Division), and Sandia Base seemed a logical choice because of its proximity to Kirtland Base. In 1944, the War Department established the Armed Forces

⁶ Howard N. Rabinowitz. "Growth Trends in the Albuquerque SMSA, 1940-1978." *Journal of the West*. (July 1979): 63.

⁷ "The Northeast Heights: Where houses multiplied like jackrabbits." *Albuquerque News*. (April 2, 1980), 7.

⁸ Howard Bryan, *Albuquerque Remembered*, (Albuquerque: University of New Mexico Press, 2006), 236.

Special Weapons Project (AFSWP) at Sandia Base to coordinate military special weapons activity conducted by the Manhattan Engineering District.⁹ In 1945, Los Alamos permanently moved its Z Division to Sandia Base to facilitate closer work with the military. Sandia's initial function was to assemble and store weapons developed at Los Alamos.¹⁰ The lab's proximity to Kirtland Field allowed it to ensure that early nuclear weapons were compatible with current military aircraft.¹¹ This permitted the Los Alamos Laboratory to focus exclusively on nuclear research. The migration of the Z Division from Los Alamos Scientific Laboratory (LASL) to Sandia Base resulted in the transfer of 1,700 LASL employees to Albuquerque.¹² The Atomic Energy Commission

⁹ The War Department became the Department of Defense with the National Security Act of 1947. "AFSWP established as an interservice agency, effective December 31, 1946, by a joint letter of the Secretaries of War and the Navy, January 29, 1947, with responsibility for discharging all military functions relating to atomic energy in coordination with the Atomic Energy Commission (established by the Atomic Energy Act of 1946 [60 Stat. 755], August 1, 1946, as a civilian agency and the sole agency responsible for development and use of atomic energy)." Records of the Defense Threat Reduction Agency, 374.2 General Records of the Armed Forces Special Weapons Project (AFSWP), <http://www.archives.gov/research/guide-fed-records/groups/374.html>.

¹⁰ Byron A. Johnson, "A Brief Look at Albuquerque's Urban Expansion 1630-1980," Research Reports, History of Albuquerque Exhibits Series Vol. I, (The Albuquerque Museum, History Division, 1981): 9; Albuquerque Tricentennial, *Seventh Grade Teachers Resource Guide*, 26 September 2005, Albuquerque: 152; Don E. Alberts, "Kirtland Air Force Base: Its Origin and Activities," Research Reports, History of Albuquerque Exhibits Series, Vol. V, (The Albuquerque Museum, History Division, March 1981): 31; The case could be made that Los Alamos would prove a better comparison to Livermore than Albuquerque. After all, these cities house the nation's two nuclear weapons labs; both were rural before the introduction of these labs; and both eventually imposed restrictions on growth to maintain that rural atmosphere. However, first, I use Albuquerque because it is a civilian city like Livermore and unlike Los Alamos. While Los Alamos, indeed, either displaced or had to integrate with an existing population, I believe that it would be best compared to another government town, such as Boulder City, Nevada. In addition, Albuquerque and Livermore were home to mostly blue-collar workers in 1940, and one can observe clashes over values between distinct types of people (such as oldtimers and newcomers) in these places. Albuquerque is also interesting, not simply for its rich local history, but because its chosen path, rising toward metropolitan status, diverges from the city of Livermore, which would more closely resemble Los Alamos in that regard, perhaps disallowing for sufficient contrast. Looking at Albuquerque allows for examination of why certain cities reacted toward growth in different ways.

¹¹ John Shunny, "New Mexico's High Tech," *New Mexico Magazine*, April 1985: 85

¹² Leroy E. Apodaca, "Wage and Salary Administration in Two Research and Development Laboratories," (MA Thesis, University of New Mexico, 1980): 29.

(AEC) took over Sandia in 1947, ensuring that the city's future as a nuclear weapons research and development center would continue after the war.

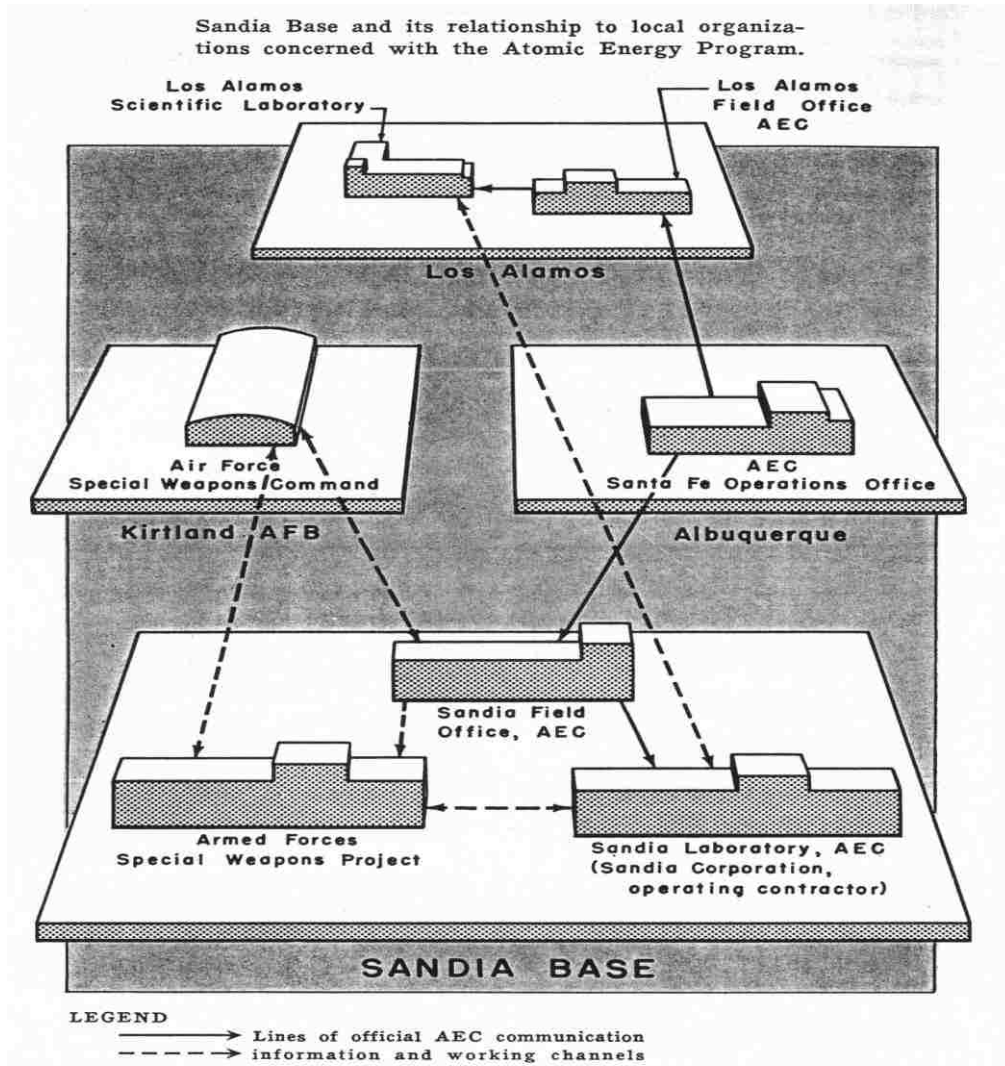


Figure 21 Sandia offered its own diagram about how it is connected to other defense facilities in the 1950s. (“Sandia, Silent Partner in Albuquerque’s Rapid Post-war Growth, Booms Commercial Construction.” *Albuquerque Progress*, XVIII 9, September 1951.)

In 1948, Z Division was renamed the Sandia Laboratory to increase efficiency between AEC offices, officially making Sandia a separate branch of the Los Alamos

Scientific Laboratory.¹³ The Western Electric Company, a prime contractor of the AEC, established the Sandia Corporation at the base in 1949 and assumed management of the Laboratory.¹⁴ As Sandia Labs grew in the 1950s, “residential construction blossomed in the scrubland north of Sandia,” which had been a barren mesa.¹⁵

Sandia’s postwar prospects were not immediately bright. Indeed, in 1945 one contemporary described it as a place where “thirty military personnel with a handful of civilians had the job of cutting up junked aircraft for the scrap heap.”¹⁶ Yet the lab’s dramatic growth greatly affected Albuquerque by the early 1950s, as Kirtland Air Force Base and the adjacent Sandia Base and Sandia Laboratories became focal points for big-budget federal defense projects in weaponry research.¹⁷ As in Livermore, the lab attracted many well-educated scientists and engineers to the city. They began to cluster in Albuquerque’s eastern outskirts, north of the Sandia and Kirtland bases.¹⁸ Albuquerque’s population rose almost 500 percent between 1940 and 1955. Casual western life, typical of a town virtually unchanged since the introduction of the Santa Fe Railway in the 1880s, was steadily replaced by urban living in postwar America.¹⁹ This was especially

¹³ Necah Stewart Furman, *Sandia National Laboratories: The Postwar Decades*. (Albuquerque: University of New Mexico Press, 1990), 258.

¹⁴ Howard Bryan, *Albuquerque Remembered*, (Albuquerque: University of New Mexico Press, 2006), 239.

¹⁵ After Sandia established Sandia National Laboratory at Livermore in 1956, it took the plural name of Sandia Laboratories; Albuquerque Tricentennial, *Seventh Grade Teachers Resource Guide*, 26 September 2005, Albuquerque: 152.

¹⁶ Fremont Kutnewsky, “Research At Sandia,” *New Mexico Magazine*, July 1958: 49.

¹⁷ Marc Simmons, *Albuquerque: A Narrative History*, (Albuquerque: University of New Mexico Press, 1982), 369-370.

¹⁸ Howard Bryan, *Albuquerque Remembered*, 239.

¹⁹ Simmons, *Albuquerque: A Narrative History*, 366.

true for previously undeveloped areas of Albuquerque in the Northeast Heights, sometimes referred to simply as “the Heights.”

Growth in the Northeast Heights

In the 1940s, the Heights boasted only “a few tourist camps, a grocery store and a few tar paper shacks,” recalled Gil Washburn, who built a home near Lomas and Wyoming Boulevards in 1950.²⁰ 1944 Street maps indicate only scattered housing east of Louisiana Avenue. The Northeast Heights were just beginning to emerge as a new frontier for residential development. By that time, five housing developments northeast of Louisiana and Central Avenues had been constructed.²¹ Wartime Albuquerque was bursting with new residents and could scarcely accommodate them all, mirroring housing shortages throughout the urban West. But this growth only encouraged Albuquerque-based developers to build. Permits for the first nine months of 1957 totaled \$6,063,560 as compared to \$5,163,952 for all of 1946. It was obvious that Sandia’s workers and families were the prime catalysts for this boom. According to the *Albuquerque Progress* in 1947, “Expansion of Sandia Base is expected to add to the demand for residential housing in Albuquerque at a time when living accommodations are still extremely tight in spite of record building for the past 18 months.”²² In that same year, the city established a Building Department to help it cope with the constant expansion.

²⁰ “The Northeast Heights: Where houses multiplied like jackrabbits,” *Albuquerque News*, April 2, 1980: 7.

²¹ Street Map, 1944, Produced by Albuquerque National Bank. Courtesy of Albuquerque Public Library Special Collections.

²² “Albuquerque Building Enters Third Quarter at Full Speed,” *Albuquerque Progress*, XIV 10, October 1947.

	Bernalillo County (1940)	Albuquerque (1940)
Population	69,391 (approximately 1:1 male/female)	35,449
Native Born	64,720	-
College Educated	1,454 men 1,212 women	-
Professional Workers	2,032	1,488

Table 4 Albuquerque Statistics in 1940.²³

The city struggled to extend its businesses sector and infrastructure to meet the demands of new residents and the service industries they helped spawn. In 1946, postwar shortages and high costs halted plans for building new schools in the Heights area. But several churches were under construction, and residential development continued at a record pace. Indeed, the city issued permits for 441 new residences, but the housing shortage persisted.²⁴ Residents and city council members were amazed by how much residential construction was underway or on the drawing board. The local renters' board requests that rent control be extended after the war clearly indicated the continuing shortage of dwelling units.²⁵

²³ In 1940, Bernalillo County (which includes Albuquerque) had a total population of 69,391. The ratio of men to women was approximately equal, and the native born population was the majority—64,720 persons. Within the county, 1,454 men and 1,212 women had college educations. Professional workers were somewhat prominent in Bernalillo County, with 2,032 men and women working in these fields. Albuquerque's population was roughly half that of the county—35,449—1,488 of whom were professional workers; Sixteenth Census of the United States, Population. *Volume II. Characteristics of the Population, Part 4: Minnesota—New Mexico*. United States Department of Commerce. C 3.223/9:940/V.2, pt 4. (Washington: United States Government Printing Office, 1943): 980; 989. Note: Professional workers included teachers, authors, chemists, dentists, engineers, physicians, librarians, and social and welfare workers, among others (9); 1019.

²⁴ "Many Business Buildings Now Nearing Completion," *Albuquerque Progress*, XIII 10, October 1946.

²⁵ "Building Construction Continues at Undiminished Pace and Volume," *Albuquerque Progress*, XVI 9, September 1949.

Housing remained at the forefront of every business person's mind. According to one trade publication, "With the coming of a Fighter Group to Kirtland Field, involving the transfer of some 2,000 officers and men to Albuquerque, local real estate men do not anticipate any surplus of residential accommodation in the near future."²⁶ Postwar growth posed a huge challenge for city planners, as "the expansion of federal mortgage guarantees and the stimulus to urban growth accompanying the growth of Kirtland field, Sandia Laboratories and related defense activities would, of course, result in continued phenomenal growth." The government built prefabricated homes at Kirtland for soldiers until permanent housing became available in the 1950s.²⁷

Even then, it was not enough. One 1951 column predicted that "the entire quota of 300 Wherry housing units for Sandia Base will be filled within a month...All but five of 128 units allotted to officers are now filled and 116 of 174 allotted to enlisted men also are occupied. This rises to 237 the number of housing units completed and occupied by Sandia Base personnel."²⁸ Meanwhile, the local power company struggled to equip the city with utilities. It was noted that "the construction of the Air Base and Sandia Base brought immediate and imperative demands for both power and gas."²⁹ But despite the

²⁶ "Albuquerque Building Construction Outstrips Other Southwestern Cities," *Albuquerque Progress*, XVI 6, June 1949.

²⁷ Charles D. Biebel, "The Suburbanization of Albuquerque, New Mexico 1900-1940," Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 58; Don E. Alberts, "Kirtland Air Force Base: Its Origin and Activities," Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 33.

²⁸ "Wherry Act military housing was begun under the authority of the National Housing Act of 1949 (a.k.a. the Wherry Military Housing Act of 1949)." http://findarticles.com/p/articles/mi_m6007/is_56/ai_n14700154/; "Sandia Housing Units Are Filled," *Albuquerque Tribune*, 14 November 1951.

²⁹ "Public Service Planning for City of 125,000 People." *Albuquerque Progress*, XIV 8, August 1947.

lack of utilities, homes and even sewers, Sandia continued to grow—forcing the city to respond.

New construction at Sandia Base always made headlines because of its ripple effect upon the local economy. For instance, when a lab spokesman announced the construction of additional facilities in 1949, “real estate men report[ed] some slight softening of prices of old residences, but...members of the Albuquerque Board of Realtors state that there is no indication that there will be any marked change in the cost of either labor or materials in the near future.” Perhaps the *Albuquerque Progress*, a business digest presumably printed by boosters, wanted to assure investors that the huge influx of residents would not drive real estate prices up.³⁰ But they were not fooling anyone. There were more workers than the city could house, and often they brought families and children with them when they moved to Albuquerque. As a result, school attendance soared during the postwar years. In the 1943-44 session, Duke City counted 8,666 students, but just three years later, education officials expected more than 12,500 students. This prediction likely considered the new high school that would be built in the Heights area, a project which had previously been deferred due to material and cost shortages.³¹

Of course, expansion was not limited to the northeast suburbs. Albuquerque’s churches, for example, increased in number from 46 during the war to 80 by October

³⁰ “Pace of New Building Continues Rapid in First Part of New Year,” *Albuquerque Progress*, XVI 3, March 1949.

³¹ “Albuquerque Schools Showing Record Increase in Students,” *Albuquerque Progress*, XIV 11, November 1947.

1949.³² In addition, municipal authorities expanded their borders. In 1949, Albuquerque annexed seventeen square miles, which increased the city's size by 82 percent. Building permits in 1949 rose 38 percent over just the previous year.³³ In fact, between 1946 and 1950, almost 6,000 private homes were built in Albuquerque at a total permit valuation of over \$32 million.³⁴ By 1950, development had expanded on the east side of Louisiana Avenue to Wyoming Avenue and extended northward about three miles to Comanche Road, where it briefly stopped. Development east of Wyoming remained negligible; it would not be until the 1960s when housing would fill the former desert hills.³⁵ There was nothing, however, to indicate that city officials felt that unrelenting growth would do anything other than bring prosperity to the former Spanish pueblo.

Albuquerque's furious building boom allowed it to surpass its southwestern rivals—Phoenix, Tucson, and El Paso—in the late-1940s. Projections confirmed that this growth did not even cover new building projects in 1949 which included “the new Lovelace Clinic building, the Medical Group Center, a new Catholic Elementary School building in the Heights, and a new Elementary School west of the river.”³⁶ Many

³² “Expansion of Church Systems Keeping Pace With City's Growth,” *Albuquerque Progress*, XVI 10, October 1949.

³³ “January Permits Topped Two Millions Following the Greatest Year Ever,” *Albuquerque Progress*, XVII 3, March 1950.

³⁴ “Private Residence Construction is Major Part of Albuquerque's Biggest Industry,” *Albuquerque Progress*, XVII 5, May 1950.

³⁵ Street Map, 1950, Produced by First National Bank in Albuquerque, Courtesy of Albuquerque Public Library Special Collections.

³⁶ “Albuquerque Building Construction Outstrips Other Southwestern Cities,” *Albuquerque Progress*, XVI 6, June 1949.

families, if they could find housing there, still lived on Sandia Base in 1950.³⁷ However, accommodations for families working at Kirtland and Sandia finally became available in the last months of 1949. The *Albuquerque Progress* observed that one construction company “announced plans to build another 1,000 dwellings, 500 of which will be in their Inez subdivision [in the Northeast Heights].” It also noted that “a super shopping area” would be constructed in the same area, and that “the Federal Government has entered the picture with its plan for 760 low cost homes for military and Government personnel in the area between Sandia and Kirtland.”³⁸

The dramatic transformation of the desert impressed residents. “[In the East], the jackrabbits have been replaced by nuclear physicists, and the view is framed by project housing, TV aerials and the vapor trails of screaming jets,” reported local citizen, Arch Napier.³⁹ An estimated 362 residential business builders and subcontractors operated in Albuquerque in 1950. They employed almost 6,000 skilled and unskilled workers with payrolls exceeding \$20 million per year. So, in addition to Albuquerque residents on Sandia’s own payroll, the lab boosted the city’s economy through its ripple effect upon construction and other industries.⁴⁰ By 1958, the workforce at Sandia itself was enormous. According to *New Mexico Magazine*, “300 draftsmen [were] employed by the Corporation to serve 1,500 or more engineers and other technical people engaged in

³⁷ Leland Johnson, *Sandia National Laboratories: A History of Exceptional Service in the National Interest*. (Albuquerque: Sandia National Laboratories, 1997), 35.

³⁸ “Last Year’s Building Record Broken in First Ten Months of ’49,” *Albuquerque Progress*, XVI 12, December 1949.

³⁹ Arch Napier, “City of Surprises: Albuquerque,” Sandia Corporation Brochure, Albuquerque, NM, No Date.

⁴⁰ “Private Residence Construction is Major Part of Albuquerque’s Biggest Industry,” *Albuquerque Progress*, XVII 5, May 1950.

weapon design and development.”⁴¹ As a result, Albuquerque boomed as skilled technocrats flocked to the “Atomic City” for defense jobs.

	Albuquerque SMSA (1950)	Albuquerque Place (1950)
Population	145,673 (109.9% increase since 1940)	96,815
College Graduates (Men)	-	3,305
Private Wage and Salary Workers	-	16,038
Engineers (within P.W.)	-	886

Table 5 Albuquerque Statistics in 1950.⁴²

Albuquerque historically had benefitted from federal spending thanks to its political connections in Washington. Democratic governor Clyde Tingley, elected in 1934, had successfully lobbied for numerous federal projects by exploiting his ties with the Roosevelt Administration. As governor, Tingley secured about \$100 million in mostly WPA funds for New Mexico.⁴³ Tingley’s largest accomplishment for the city was procuring \$1 million in federal money for the University of New Mexico, an institution that would prove crucial for educating technical workers in the city.⁴⁴ By 1953, the University of New Mexico boasted an enrollment of 4,200 undergraduate students and a

⁴¹ Fremont Kutnewsky, “Research At Sandia,” *New Mexico Magazine*, July 1958, 51.

⁴² By 1950, the population Albuquerque’s SMSA had increased to 145,673 people, a 109.9 percent increase from 1940. The median age was 26. Albuquerque itself was home to 96,815 people, of whom 22,365 were married. Among men, there were 3,305 college graduates. 16,038 worked as private wage and salary workers, while another 3,995 men were government employees. By far, male engineers (886) were the largest occupational group within professional, technical, and kindred workers in 1950 (the runner up was accountants and auditors, numbering 373). More broadly, in the state of New Mexico, the number of male technical engineers jumped from 838 in 1940 to 2,421 in 1950 (New Mexico counted 22 female engineers in the state in 1950); A Report of the Seventeenth Decennial Census of the United States. Census of Population: 1950. *Vol. II. Characteristics of the Population. Part 31. New Mexico.* (Washington: United States Government Printing Office, 1952): 31-15; 31-34; 31-95; 31-101.

⁴³ Bryan. *Albuquerque Remembered*, 218.

⁴⁴ Simmons, *Albuquerque: A Narrative History*, 365.

graduate population of 700. Accelerated construction projects in the 1950s enabled Albuquerque to accommodate the demands of higher education for its residents, especially those related to the Lab. And the university would continue to educate generations of Albuquerque residents, creating intellectual capital and expertise for the city that would later entice high-tech industries to open branch offices in the city. The establishment of Sandia in Albuquerque, like the lab in Livermore, was not a project for which the city could lobby. However, Albuquerque boosters could piggy-back on their good fortune of getting the lab without solicitation.

With the lab expanding during the early Cold War years, builders seized growth opportunities and development continued across the mesa. Construction totals for the first six months of 1950 exceeded \$15 million—about a 70 percent increase over the previous year. The area south of East Central and east of Yale Avenue particularly interested city boosters. As one observer remarked, “Judging from the landscaping efforts of owners of new homes, it won’t be long before even the newest additions take on the shady, well developed look characteristic of the older areas. In years to come, Albuquerque should become one of the prettiest residential cities in the nation.”⁴⁵ Already home to several research hospitals, the city welcomed the Lovelace Clinic and Bataan Methodist Memorial Hospital in 1950-52. Retail trade also grew; the Hoffmantown Shopping Center was begun at Wyoming and Menaul in 1951, and construction of St. Joseph’s Cole (later Albuquerque University) began on a sixty-acre site along the west mesa.

⁴⁵ “Albuquerque Building Continues to Gain As \$30 Million Dollar Year is Forecast,” *Albuquerque Progress*, XVII 7, July 1950.

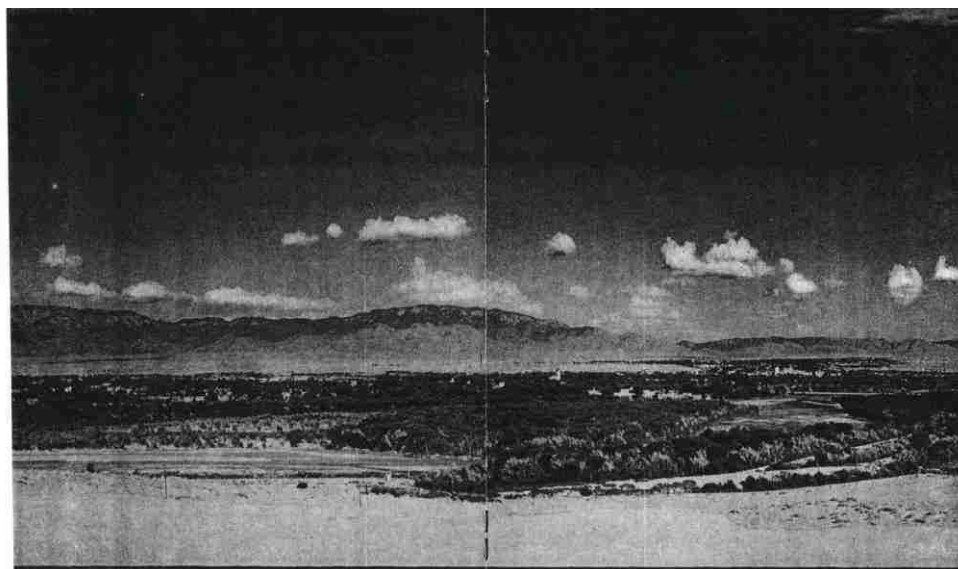


Figure 22 Expansive land in Albuquerque was seen by one newspaper reporter as an opportunity for suburban development. Value was placed on changing the desert from a “wasteland” to an oasis. *Photo caption reads:* “Looking east from the west mesa toward the ageless Sandias, the fertile Rio Grande Valley stretches north and south as an oasis in a sea of rugged land. Beneath these lovely old trees are situated some of Albuquerque’s finest homes. As Albuquerque grows, so, too, do its shaded areas expand. Noticeable at right center, are the trees located around the development up East Central. In another ten years, most of today’s new development will be similarly shaded.” (“Many Fine Homes Reflect Albuquerque’s Importance as Economic Center of State,” *Albuquerque Progress*, XVII 10, October 1950.)

Obviously the growing federal preserve in the Northeast suburbs resulted in the movement of stores and commerce from the old downtown core outward to the periphery, a trend common to all developing metropolitan areas in the twentieth century. Also, downtown supported a largely Hispanic and Catholic community of lower-income workers who were mainly Democrats—constituents who were increasingly neglected as the city’s ruling elite began catering to suburban middle-class conservatives. Just as it had raised concerns in 1920s and 1930s Los Angeles, the exodus of businesses from the downtown area to the Heights alerted downtown business association members to take action to re-capture the growing tax base on the city’s northeastern periphery.⁴⁶

⁴⁶ Byron A. Johnson. “A Brief Look at Albuquerque’s Urban Expansion 1630-1980.” Research Reports, History of Albuquerque Exhibits Series Vol. I, (The Albuquerque Museum, History Division, 1981): 9. For more information about the dynamics and change between Old Town Albuquerque and the

But this would prove an almost futile effort. Before 1950, Albuquerque had annexed land that already contained substantial populations. After 1950 and especially during the early 1960s, however, the city was even more aggressive, acquiring massive acreages of empty land at the request of developers who hoped that city incorporation and services would make their subdivisions more attractive to prospective home-buyers.⁴⁷ In sharp contrast to Livermore, Albuquerque pleased developers by annexing what they hoped would be a separate village—land around San Pedro Ave., Winrock-Coronado, Broad Acres and Hoffmantown. One local newspaper applauded the fact that “by supplying city services, the annexations literally paved the way for the developments that followed in rapid succession.”⁴⁸ Many would be upscale, family-oriented housing tracts—a far cry from the instant base housing of the late-1940s. Boosters touted the Inez Addition in 1950 as the newest and finest suburban residential area.⁴⁹ “It was a marvelous area for families,” said Billie Driggers, who moved with husband, Skip, and their three children into Inez in September 1950. She said that children could walk home for lunch and the parks provided plenty of recreation. “I hope we don’t have to move further east,” she commented in 1981. “In retirement, our house is just the right size.”⁵⁰

Northeast Heights, see the full text of this citation, available at the Center for Southwest Research at the University of New Mexico in Albuquerque.

⁴⁷ Howard N. Rabinowitz, “Growth Trends in the Albuquerque SMSA, 1940-1978,” *Journal of the West*, 18 (July 1979): 65.

⁴⁸ “The Northeast Heights: Where houses multiplied like jackrabbits,” *Albuquerque News*, 2 April 1980: 7.

⁴⁹ Howard N. Rabinowitz. “The Transformation of Albuquerque 1940-1981.” Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 14.

⁵⁰ Pat Kailer. “Heights Development Ends Once-Placid Environment.” *Albuquerque Journal*. Page 1, Section C-2, 5 July 1981.

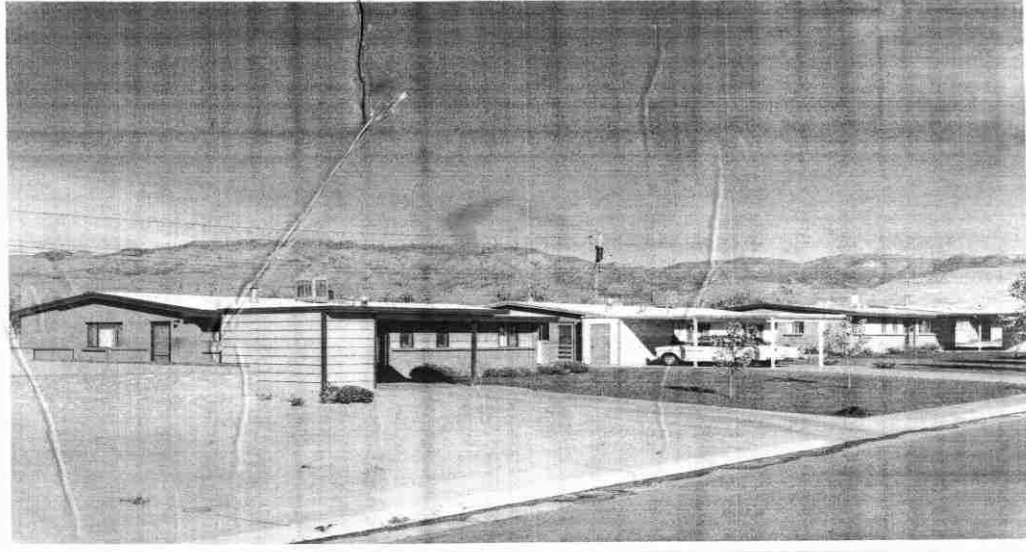


Figure 23 A typical suburban house in the Albuquerque’s “Heights” reflects the postwar ideal of home-ownership and ranch-style architecture and living. (“Alb. Heights.” No Date. Courtesy of UNM Center for Southwest Research.)

As noted, most new Albuquerqueans (many of whom were lab personnel) in 1950s and 1960s moved into the Northeast Heights, which one contemporary described as a “mini-model community with popular schools, a generous supply of parks, a major library and its own little shopping center—the first of its kind in the city.”⁵¹ In 1950, the Heights boasted a population of 3,622 people and posed a growing threat to downtown’s traditional hegemony.⁵² As historian Marc Simmons noted, “From the 1950s on, the fashionable Heights drained people, businesses, and capital away from the city’s older core. Commercial and residential properties [in Old Town and downtown] deteriorated, and the spirit of civic pride and responsibility that had characterized Albuquerque only a generation before seemed to evaporate.” Moreover, the economic base of the “Atomic City” lay in the military-space industry centered in the East Heights and served to direct

⁵¹ Bryan, *Albuquerque Remembered*, 244.

⁵² Charles D. Biebel, “The Suburbanization of Albuquerque, New Mexico 1900-1940,” Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 58.

funds away from downtown, which gradually led to its decline. New development occurred in the Heights.

To be sure, the influx of newcomers, a large body of well-educated persons who were “cosmopolitan in their attitudes and tastes,” altered the city’s social complexion and political structure. By 1960, Albuquerque claimed more PhDs per capita than any other American city, and while the economy surrounding the bases thrived, the city’s longtime and native, mostly poor, inhabitants were increasingly neglected. As one source explained, “Middle-class residents swarming into the East Heights were mainly Republicans, [who were] moderately conservative in their voting habits. Indeed, by the late 1950s, they constituted one of the major vote blocs in statewide elections.” In 1938, Clyde Tingley returned from his position as Governor in Santa Fe to Albuquerque to chair the city commission (a job equivalent to “mayor” in the city); however, his liberal policies did not resonate well with new residents who objected to increased taxation and Tingley’s intention of diverting significant revenue downtown to fund minority services. As a result, his Republican opponent, Albert E. Buck, won the 1947 election and made sure that the Heights continued to receive increased city funds and attention which only reinforced growth.⁵³

Municipal officials intensified the trend. In 1952, Albuquerque annexed Snow Heights, built by developer Ed Snow in the Northeast Heights, next to Winrock Center.⁵⁴ One fashionable suburb after another began to appear. Homes in the area north of East Central were photographed and portrayed as examples of the current, fashionable

⁵³ Simmons, *Albuquerque: A Narrative History*, 373; 370; 371.

⁵⁴ Rabinowitz, “The Transformation of Albuquerque 1940-1981,” 2.

architectural style and preferred location in postwar Albuquerque.⁵⁵ In the Northeast Heights, street patterns had a “low degree of connectivity and different land uses [were] more widely separated” differing from the downtown district, which contained many older adobe homes on small lots.⁵⁶ Neighborhoods of Ridgecrest and Altura Park, in the Southeast and Northeast respectively, closer to the lab and Kirtland, were “garden suburbs” boasting modestly curved streets, more extensive street landscaping, ample parking space, larger lots, larger residential setbacks, and a lower mix of land uses.⁵⁷

Numerous Sandia workers indentified in Albuquerque’s newspapers during the postwar years (who did not live on base) lived in the Northeast Heights. It was common practice to append the addresses of people mentioned in the newspaper to their names, which included an easily recognized neighborhood, or spatial, location (NW, SW, NE, or SE).⁵⁸ A 1956 street map of Albuquerque reflects the dramatic growth in the Northeast. A sixteen-square-mile chunk, divided into a grid, contained suburban housing throughout, served by two dozen parks, six schools, and at least three new churches that catered to the continually expanding population. In the Southeast, north of Sandia, there was also some

⁵⁵ “Private Residence Construction is Major Part of Albuquerque’s Biggest Industry,” *Albuquerque Progress*, XVII 5, May 1950.

⁵⁶ Wade Patterson, “The Rise of the Regional City,” *New Mexico Historical Review*, 82 1, Winter 2007:5.

⁵⁷ *Ibid.*, 6.

⁵⁸ For example: “2 Sandia Workers Receive Honors,” *Albuquerque Tribune*, 25 July 1964; “Sandia Workers Get 10-Year Service Awards,” *Albuquerque Journal*, 1 June 1958.; “22 Sandia Workers To Receive Awards,” *Albuquerque Journal*, 14 June 1958; “Sandia Corp. Promotes Four,” *Albuquerque Tribune*, 17 October 1958.

growth, but three schools had already been established on base by this time, which therefore required less city infrastructure in the area.⁵⁹

But elsewhere school construction could hardly keep up with the influx of newcomers and the postwar baby-boomers, as Albuquerque struggled to erect new schools and add more classrooms to existing facilities. Freeway building further intensified growth on the city's edge. Following approval of the Eisenhower Administration's Interstate Highway Act of 1956, New Mexico highway engineering officials immediately exploited Albuquerque's strategic location on the traditional route linking Texas with California, and with Denver and even Mexico. Construction soon began on Interstates 40 and 25 as well as branch roads to the Northeast Heights, all of which eased transportation for suburban commuters traveling from their homes in the increasingly distant Northeast to work at Sandia Labs.

Perhaps the "labbers" in Albuquerque did not respond to furious growth by forging a slow growth movement, as in Livermore, because city planners allowed for substantial amounts of green space. Water and sewage treatment issues were not as pronounced in Albuquerque as they were in Livermore. Residents were largely pleased with the introduction of new shopping centers, roads, and residential development, because it enabled a mostly urbanized group of transplanted residents to enjoy suburban amenities and feel more comfortable despite their isolated location in the southwestern high desert. This fact is in stark contrast to the geographic position of Livermore, which was close enough to a large metropolitan center that it could afford to remain relatively

⁵⁹ Street Map, 1956, Produced by Standard Oil Company of Texas. Courtesy of Albuquerque Public Library Special Collections; It was no coincidence that development took place in the northeastern quadrant of the city. It contained the only undeveloped land by the lab that was available, as Albuquerque can be considered somewhat "landlocked" by both federal and tribal lands.

small. If Albuquerque had not grown, in contrast, there simply would have been nowhere for its residents to acquire the amenities that postwar America suburbanites expected.

\$7500 TOTAL
No closing costs and only \$41.00 per month
with reasonable down. Sandia employees
can knock the high cost out of rent and
transportation costs. Phone 5-2023 or 4-1237
and ask for Mr. McIntosh. for full particu-
lars on this home located at 2413 N. Va-
lencia Dr.
CRESCENT REALTORS
5701 E. Central

Figure 24 Real estate ads urged Sandia workers to buy homes in the Northeast Heights, pushing development in a direction away from downtown. (Real Estate Advertisement, *Albuquerque Journal*, 6 March 1952.)

Sandia Labs replaced the Santa Fe Railroad as Albuquerque's largest private employer after the railroad converted to diesel locomotives in the early 1950s.⁶⁰ In 1953, 108 federal agencies and offices in Albuquerque employed 9,200 workers. Sandia Corporation claimed about 5,000 of these, and continued to recruit specialists and replacement workers at the rate of about 2,000 employees per year.⁶¹ By 1958, the *New Mexico Magazine* announced that Sandia was New Mexico's largest employer.⁶² But Albuquerque was also making strides of its own. The *Albuquerque Progress* noted that "It is interesting...and relevant to the gains made in all other business indices in 1949, which construction authorized in the city, plus the building program at Sandia Base, equaled more than all the rest of the state combined. Even without the \$22 million

⁶⁰ Howard N. Rabinowitz, "The Transformation of Albuquerque 1940-1981," Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 5.

⁶¹ Howard Bryan, *Albuquerque Remembered*, 244.

⁶² Fremont Kutnewsky. "Research At Sandia." *New Mexico Magazine*. July 1958: 50.

building program at Sandia, Albuquerque construction far exceeded that of any other city in this section of the country—validating once again Albuquerque’s claim to the title of ‘The fastest growing city in the Southwest.’”⁶³

While many citizens rejoiced at the city’s expanded tax base and the benefits of growth, a few wondered aloud about what *exactly* the lab was doing. Citizens could only guess about the exact top secret research being conducted at the lab.⁶⁴ Most people were unaware of the scope and nature of the research and testing occurring at Sandia. As one corporate brochure explained, “Direction of research and development at Los Alamos and Sandia Laboratories and the testing in Nevada and Eniwetok is centered in the AEC’s Santa Fe Operations Office which—despite its name—is in Albuquerque.”⁶⁵ As one local writer noted, “Sandia’s responsibility doesn’t end even after the weapon has been fabricated and assembled. They put it in storage in secret sites and they maintain constant surveillance of the stockpiled items, making regular inspections to be sure that the devices are always ready for action. The stockpile is kept up to date with new developments and modifications added to stored weapons.”⁶⁶ Locals grappled with the lab’s effects on the state of New Mexico. “On one hand, most of us still haven’t begun to realize the great changes this ‘atomic activity’ has brought about in our city,” said Arch Napier, long-time New Mexican. “Yet on the other hand, we are too ready to explain

⁶³ “January Permits Topped Two Millions Following the Greatest Year Ever,” *Albuquerque Progress*, XVII 3, March 1950.

⁶⁴ See Exhibits for a somewhat vague “press release” issued by Sandia Corporation in the *Albuquerque Journal* in 1951.

⁶⁵ Arch Napier, “City of Surprises: Albuquerque,” Sandia Corporation Brochure, Albuquerque, NM, No Date.

⁶⁶ Fremont Kutnewsky, “Research At Sandia,” *New Mexico Magazine*, July 1958: 51.

everything that has happened here in terms of the ‘secret stuff at Sandia Base.’”⁶⁷ When the public and local media learned about operations, they were often shocked, but as in Livermore, there was little if any local opposition to the work or the dangers it might pose to the populace.

Sandia Corporation president Donald Quarles succinctly summarized the lab’s role: “We take the explosive material design and test devices which will utilize its properties to the utmost.” The corporation also had the responsibility for maintaining “quality” of the devices during storage, in addition to the stockpiling of nuclear weapons. When the Sandia National Laboratory in Livermore formed under the company’s auspices in 1956 to assist Los Alamos’ competition in the design of nuclear explosives, Sandia’s responsibilities increased further.⁶⁸ The company’s operations then expanded to Nevada, using the desert terrain as the site to test Sandia’s weapons casings. Many employees traveled to Nevada to facilitate these tests. In 1958, for example, approximately 90 workers traveled to the Nevada Test Site to conduct such work. Many of them had just returned from the earlier test series at Eniwetok Atoll and were quartered at Camp Mercury, 65 miles northwest of Las Vegas.⁶⁹

Sandia’s reach was growing longer. But in Albuquerque, the labs did not just foster growth by its mere presence, the Labs reinvested in the city as well. On the public relations front, Sandia gave back to its host city. Lab personnel supported community organizations in both Albuquerque and Livermore. Contributions in the 1950s totaled

⁶⁷ Ibid.

⁶⁸ Doyle Kline. “Deadly A-Bomb Designed, Made At Sandia Base.” *Albuquerque Tribune*. 22 April 1952; Leland Johnson, *Sandia National Laboratories: A History of Exceptional Service in the National Interest*, (Albuquerque: Sandia National Laboratories, 1997), 49.

⁶⁹ “Sandia Workers Have Major Roles in Tests.” *Albuquerque Tribune*. 17 October 1958.

\$10,000 from Employee Contribution Plans giving; this was 20 percent of the total United Way pledge from the city of Albuquerque.⁷⁰ In 1959, Sandia initiated a Technical Development Program (TDF), to educate its personnel at the University of New Mexico. In the following year, 75 new BAs from Electrical and Mechanical Engineering Departments joined the TDF. Two years later, 78 persons had completed the program, and 37 participants still worked at Sandia in 1985, almost 25 years later. Sandia focused on higher education for its workers long before anything more than a BA was typically required for most skilled or scientific jobs.⁷¹

The lab also served its workers' banking needs. It chartered the Sandia Laboratory Federal Credit Union in October of 1948 because housing and financial services were in short supply near the base. The bank's assets slowly grew. In 1949, the Credit Union's assets totaled \$11,765.87, with \$9,445.35 out in loans and a delinquency rate of almost 12 percent, but by 1955, assets approached \$1 million. In 1988, a Credit Union Center opened a new office in the far Northeast Heights of Albuquerque, because over 70 percent of Credit Union members (presumably Sandia workers) lived within two miles of that facility. By 1995, the bank's assets surpassed \$388.4 million, making it Albuquerque's largest locally owned financial institution and for local businesses, the major source of loans.⁷²

Sandia Base, Sandia Laboratories, Sandia Corporation, Kirtland and Manzano Air Force bases, local offices of the Atomic Energy Commission, and many satellite manufacturing firms and service agencies made up what became known as "The

⁷⁰ Johnson, *Sandia National Laboratories*, 153.

⁷¹ *Ibid.*, 76-77.

⁷² *Ibid.*, 189.

Complex.” To reiterate, the main objective of this cluster of defense agencies was to meet the Pentagon’s technological needs during World War II and later in the Cold War. As tensions escalated between the Soviet Union and the US, after the outbreak of the Korean War in 1950, more defense spending flowed into Albuquerque and population grew. Indeed, “From 1951 to 1961 the number of Sandia Corporation employees increased from 3,800 to 7,800, while its payroll, the largest in New Mexico, expanded from \$12 million to \$65 million.” America’s newest industry—“applied thinking”—assumed a key position in Albuquerque’s economy, and with its emphasis on atomic-age research, reporters began to refer to the city as the “scientific mecca of the West.”⁷³ Residents had no reason to question what this economic dependence on defense dollars might mean for the city in later years. Leaders at the time simply moved to acquire more money.

Fitting the Nash-Abbott model, Albuquerque advocate and booster, Senator Clinton Anderson pushed the Pentagon and AEC to move into new research areas to ensure his city’s continued prosperity. “These military needs today might be commercial possibility tomorrow,” Anderson observed in 1958. He also declared that “the industry of knowledge” may be developed in the southwest, and that if Los Alamos and Sandia Laboratories should not be needed for military purposes then “manpower, machines and leadership might be turned to the peacetime applications of the split atom in the fields of medicine, agriculture and industry.”⁷⁴ In hindsight, this sentiment can only be described as visionary.

⁷³ Bradford Luckingham. *The Urban Southwest: A Profile History of Albuquerque – El Paso – Phoenix – Tucson*. (El Paso: Texas Western Press, 1982), 76-77.

⁷⁴ “‘Few Millions’ May Assure A-Rocket, Sen. Anderson Says.” *Albuquerque Journal*, 25 May 1958.

As the 1960s dawned, the boom only continued. Census figures reflect the explosive quality of the previous decade (see Table 6). And Sandia employees were well-compensated for their efforts. Professional workers earned the highest incomes, \$7,268 per year on average, while the male median income for all professions was \$5,061 per year.⁷⁵ According to Sandia's president, S.P. Schwartz, 6,850 employees received almost \$54.7 million in salaries during 1961, and this figure did not include an additional payroll of \$7.5 million to Sandia employees in Livermore, California.⁷⁶ This increasingly strong tax base in the Northeast Heights and area's growing number of voters and influential figures led the city to shift more resources for streets, lighting, and police and fire service in that direction. In 1980, homes built in the Northeast Heights between 1950 and 1959 were over 52 percent owner-occupied, with many tracts in the area boasting an over 70 percent owner-occupancy. Moreover, residential longevity contributed to the area's significance; careers spanning 30 or 40 years were not unusual at Sandia.⁷⁷ In short, people who had settled in the Northeast Heights tended to stay there.⁷⁸ And thanks to Albuquerque's temperate climate, many retired there as well.

⁷⁵ The Eighteenth Decennial Census of the United States, *Census of Population: 1960, Volume 1. Characteristics of the Population. Part 33. New Mexico*. (Washington: US Bureau of the Census):, 33-109.

⁷⁶ "Sandia Workers' 1961 Salaries Near \$55 Million." *Albuquerque Journal*. 24 December 1961.

⁷⁷ Johnson, *Sandia National Laboratories*, 10.

⁷⁸ 1980 Census of Population and Housing. *Census Tracts. Albuquerque, N. Mex. Standard Metropolitan Statistical Area*. Issued June 1983. (Washington: US Bureau of the Census): H. 26-27.

	Albuquerque Central City (1960)
Population	201,189 (100.8% increase from 1950)
Percent in White Collar Occupations	59
Professional Male Workers (out of 46,945 employed)	9,406
Engineers (within P.W.)	2600
Holding BA Degrees	43,376 (doubled since 1950, quadrupled since 1940)
New Homeowners (Moved into house between 1959-1960)	75,374
Long-time Homeowners (had always lived in their house)	12,037

Table 6 Albuquerque Statistics in 1960.⁷⁹

By 1960, the suburbs in the Northeast Heights were encroaching upon the Sandia foothills, east of the city line. There were residential subdivisions north of Central Avenue between Eubank and Panorama Boulevards, branching from the mid-1950s developments in an eastward direction.⁸⁰ Expansion somewhat halted at Panorama Blvd by 1960, however, as builders shifted to infilling the vacant areas in the Northeast Heights with housing—a move that created a dense sprawl of mostly single-family homes. In 1967, Sandia conducted a survey among its workers regarding their willingness

⁷⁹ Albuquerque’s central city hosted 201,189 residents in 1960, a 100.8 percent increase from 1950. Fifty-nine percent of city residents worked in white collar occupations— professional, managerial (except farm), clerical, or sales work. By this time, 43,376 people in Albuquerque had earned bachelor’s degrees—a number doubled from 1950s and *quadrupled* from the 1940s. Out of the total population, 75,374 who had moved into a house did so between 1959 and 1960. There were only 12,037 homeowners surveyed who had always lived in their house. Out of 46,945 employed male workers, professional, technical and kindred workers totaled 9,406, of which the largest proportion—again—were engineers (2600); The Eighteenth Decennial Census of the United States, *Census of Population: 1960, Volume 1. Characteristics of the Population. Part 33. New Mexico*. (Washington: US Bureau of the Census): 33-11; 33-63; 33-71; 33-101; 33-105.

⁸⁰ Street Map, 1960, Courtesy of Albuquerque Public Library Special Collections.

to consider bus-pooling to work. The response was overwhelmingly positive: out of 421 replies, 353 workers expressed interest in busing from the Northeast Heights to Sandia.⁸¹



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Figure 25 Mobile homes were available near the Bases, and they were directly advertised to workers on Base in this 1971 “Welcome to Sandia Corporation” brochure. Modernized, fully equipped homes and mobile parks were stressed as an incentive for sophisticated newcomers to settle in the still-growing southwestern town. (“An Unofficial Guide Published by Boone Publications, Inc.” Albuquerque, New Mexico. Defense Nuclear Agency. Lubbock, Texas: May 1, 1971.)

As the Northeast foothills filled in, suburban development remained northern and began to approach higher terrain.⁸² This expansion would become a trend in Albuquerque in later years for more affluent residents (into an area appropriately named Sandia Heights), and the early stages of this process were apparent by 1970. Even as early as 1963, when the Coronado Center shopping complex opened just to the northwest on land

⁸¹ “Recent Survey Shows Large Number of Sandians Interested in Bus Pool.” *Sandia Lab News*. Vol. 19, No. 21. 20 October 1967.

⁸² Street Map, 1965, Courtesy of Albuquerque Public Library Special Collections.

originally owned by Dale Bellamah, residents had mixed reactions about the addition of large-scale shopping centers to their otherwise residential enclaves. The city originally zoned most property in the Northeast Heights for single-family dwellings. New additions such as Winrock Center and the Interstate were strong decentralizing forces in the city that encouraged development farther north and east.⁸³ The Sandia Mountains somewhat halted eastward development, but the most affluent residents settled in the foothills, and some even decided to commute into and over the Sandias for the privilege of living in a semi-wilderness environment. In the 1970s, however, suburbanization gradually swerved to the northwest where improved roads (and possible bus service) kept the commuting time of Sandia workers under an hour but the distant mountain scenery still picturesque. Movement to the unincorporated community of Rio Rancho (in neighboring northwest Sandoval County) would continue to be a place outside the city for affluent residents to settle well into the twenty-first century.⁸⁴ But, in the 1960s and 1970s, most Sandians remained in Albuquerque proper.

⁸³ Howard N. Rabinowitz. "The Transformation of Albuquerque 1940-1981." Research Reports, History of Albuquerque Exhibits Series Vol. V, (The Albuquerque Museum, History Division, 1981): 22.

⁸⁴ Street Map, 1970, Courtesy of Albuquerque Public Library Special Collections.

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Figure 26 Dale Bellamah was a key figure in Albuquerque’s housing boom of the 1950s and 1960s. Between 1949 and 1959, he initiated construction of more than 3500 homes in subdivisions in the Heights, the cornerstone of his wealth being focus on moderately priced, single-family homes. Again, “hipness” was emphasized as a selling point. (“An Unofficial Guide Published by Boone Publications, Inc.” Albuquerque, New Mexico. Defense Nuclear Agency. Lubbock, Texas: May 1, 1971.)

Housing stayed in demand as the lab continued to expand and acquire federal contracts. As one in-house publication noted, in the 1960s Sandia “participated in design and testing of weapons ranging from the B61 to the warheads for Minutemen and Poseidon missile systems...the Safeguard antiballistic missiles[,] and initiated exploratory programs for miniaturization and new weapons development.” Sandia employed 7,860 workers at this time.⁸⁵ And while it had grown in the 1950s, when the Nuclear Test Ban Treaty’s moratorium on testing went into effect in 1958, Sandia encountered the possibility that its lab would not continue forever. By 1961 it faced its first reduction in force. But the Cold War continued to fuel more growth, as Soviet-American tensions escalated in the wake of the Bay of Pigs fiasco and the Cuban Missile Crisis of 1962. Once the moratorium on nuclear testing ended, research resumed, and the decision in 1962 to end atmospheric nuclear testing and mandate that all future Soviet

⁸⁵ Johnson, *Sandia National Laboratories*, 152; 87.

and American tests be conducted underground meant huge excavation projects and more defense money for Sandia. But even before this, Sandia officials had planned to diversify the Labs' work, as Senator Anderson had urged just a few years earlier. Commentators often mentioned in their columns that Sandia prepared to stay at full force even if weapons research or stockpiling should cease. As early as 1958, one observed that "Sandia is hastening the day when private industrial development will take its place alongside government contracts as an important factor in the State's economy."⁸⁶ Other initiatives, such as roles in NASA's VECA program, environmental sensing device programs, and development of reentry heat shields during the moratorium kept Sandia at the forefront of national security.⁸⁷ City leaders began to consider the potentially detrimental effects of a single-industry economy.

But the spread of development beyond weapons research would not completely take hold until the 1970s. Meanwhile, Sandia continued to push forward with construction projects in the 1960s at Sandia Labs, Livermore Labs, and the Tonopah Test Range in Nevada. The total value of these buildings equaled \$6.4 million, which included Developmental Laboratory Bldg. 807, a new rocket sled track, a Vibration Data & Control Center in Area III, Security First Aid & Communications buildings, and elevated water tank at Tonopah Test Range.⁸⁸ While Sandia Lab's employment remained roughly the same between 1964 and 1965, the base's payroll figures increased about \$2.3 million. In addition, "purchases by the [Sandia] corporation in New Mexico amounted to more

⁸⁶ Kutnewsky, "Research At Sandia," 72.

⁸⁷ Johnson, *Sandia National Laboratories*, 117.

⁸⁸ "Sandia Construction Projects in Process Total \$6.4m; \$7m Completed in FY '67." *Sandia Lab News*. Vol. 19, No. 19, 22 September 1967.

than \$20.3 million [in 1964,] of which about 98 percent went to Albuquerque firms.”

Sandia was definitely a key, if not *the* key player in the city’s economy, and showed no signs of slowing down its pace.⁸⁹

In addition to high payrolls, the corporation’s assets grew annually. In 1963, the *Albuquerque Tribune* reported that “The land area Sandia uses locally includes some 2,840 acres for technical areas and about 32,400 acres in Coyote Test Field which are used under an agreement with the military... There are 146 major building or test facilities in the local Sandia complex and eight major installations in Coyote Test Field. These figures do not include military facilities or Lovelace Foundation facilities on Sandia Base.”⁹⁰ In the 1960s and 1970s, Sandia focused on research that would strengthen its military appeal and bolster its role in nonstandard defense. This emphasis resulted in a concerted effort to hire more scientists and engineers.⁹¹ Lab officials continued to feel confident about its prominent place in the research and development industry. K.A. Smith, director of Personnel 3100, was especially confident about the caliber of workers the lab could hire. “There are several factors that we feel are distinctly in our favor in recruiting for Sandia Lab,” Smith said. “Among these are the highly technical and viable climate of the Lab, the Albuquerque location, the outstanding laboratory facilities we have here, and, of course, an excellent recruiting team.” He also cited the enthusiasm of Sandians for their work and for New Mexico as other assets for

⁸⁹ “Payroll Figures Climb This Year At Sandia Base,” *Albuquerque Journal*, 14 July 1965.

⁹⁰ “Sandia Lab’s Assets Grow,” *Albuquerque Tribune*, 10 September 1963.

⁹¹ Johnson, *Sandia National Laboratories*, 7.

the company.⁹² Sandia Corporation clearly took pride in its role as one of the Atomic Energy Commission's (and later the D.O.E.'s) principal nuclear weapons development installations in the United States.⁹³

Sandia's Expansion and Estimates for the Future

To further enhance the appeal of working at Sandia, the company published the *Sandia Lab News*, a weekly publication, for its workers (and their families) in Albuquerque (and, after 1956, at Livermore) that provided a glimpse into the lives of Sandians at that time. The newsletter followed the same basic format for each issue: sections concerning who was promoted or retiring, activities at the Coronado Club (the on-base recreation hall), and research and development news. A 1967 issue emphasized longevity with the company as well as a relatively young staff at Sandia. The average "Sandian" (as they called themselves) had worked there 9.9 years, and 124 employees had been in service over 20 years (when Los Alamos National Laboratory was operated by the University of California). Surprisingly, only 331 employees had retired since the company's formation, indicating their contentment with their work and their city.⁹⁴

Many educated workers and families flocked to Albuquerque due to the economic boom, research opportunities, and growth. To be sure, local newspapers also recognized and applauded the city's dramatic expansion. In 1973, the *Albuquerque News* reported that the city "covered an area of 82 square miles—up drastically from the 11 square miles

⁹² "Group of 45 Potential Employees Visits Sandia for Interviews, Tours," *Sandia Lab News*, Vol. 18, No. 26, 30 December 1966.

⁹³ "Entrance to Field Command Headquarters," *Albuquerque salutes: Field Command, Defense Atomic Support Agency, Sandia Base, New Mexico*. (Lubbock, Texas: Boone Publications, Inc., 1967): 9.

⁹⁴ "Average Sandian Has Worked Here 9.9 years; Is Age 40.7 Years," *Sandia Lab News*, Vol. 19, No. 18, 8 September 1967.

that was called Albuquerque in 1940.”⁹⁵ According to historian Howard Rabinowitz, Albuquerque was a post-industrial city “dependent upon a government- and service-oriented economy that in 1970 had only seven percent of its workforce in manufacturing jobs.”⁹⁶ In 1970, the total population was 243,751, an increase of 21.2 percent from 1960.⁹⁷ Other data indicated that the metropolitan area continued to possess one of the nation’s most educated workforces, as defense contractors supplying the labs clustered around it by locating some of their manufacturing plants nearby.

Workforce	8,240
Average Age	40.7 (majority between 26 and 50)
PhDs	281
MAs	891
Baccalaureate Degrees	1,704
Married	1,488 women and 6,752 men, with an average of 1.75 dependent children
Single	654 bachelors and 457 single women
History of Military Service	4,098 men had served in the armed forces, along with 26 women

Table 7 A profile of Sandia Corporation’s workforce in 1967.⁹⁸

Obviously, Kirtland Air Force Base also contributed to Albuquerque’s continued prosperity. In 1971, Kirtland absorbed Sandia and Manzano bases to become a single Air Force facility.⁹⁹ By 1980, it was the state’s largest employment site, with 16,000

⁹⁵ “The Northeast Heights: Where houses multiplied like jackrabbits.” *Albuquerque News*, 2 April 1980.

⁹⁶ Rabinowitz, “Growth Trends in the Albuquerque SMSA, 1940-1978,” 63.

⁹⁷ 1970 Census of Population, *Volume I. Characteristics of the Population. Part 33. New Mexico*, Issued January 1973, Washington: US Bureau of the Census): 33-14.

⁹⁸ “Average Sandian Has Worked Here 9.9 years; Is Age 40.7 Years,” *Sandia Lab News*, Vol. 19, No. 18, 8 September 1967.

⁹⁹ Bryan, *Albuquerque Remembered*, 259.

employees, including 7,000 at Sandia. Kirtland's military and civilian payrolls totaled \$437 million in 1979, which generated 33,329 new jobs and added \$361 million to Albuquerque's economy."¹⁰⁰ But the question remained: How did Sandia Labs make all this money? Of course, the simple answer was that the Departments of Energy and Defense gave it to them. But many non-Sandian Albuquerqueans stayed curious about what was happening on the city's outskirts at this giant technological complex. By the early 1980s, before the Reagan Administration added Star Wars-related projects (officially called the Strategic Defense Initiative or SDI) to its agenda, Sandia literature reported that it was still "arming, fuzing and firing systems, ballistic cases and related hardware" that turn explosive assemblies (designed by Los Alamos National Lab and Livermore Laboratories) into nuclear weapons. They might have been a little modest.¹⁰¹ But Los Alamos and Sandia were also "deeply involved in non-nuclear projects as well, in areas relating to solar energy, medicine, laser development, bacterial and viral identification, counterterrorism research, security safeguards for classified or sensitive installations, [by 1984] particle beam research, and more."¹⁰² A Sandia constructed 'power tower' was the first phase of the federal government's \$8 million five-year program to develop solar-electric power in 1976. The government's ambitions were to

¹⁰⁰ Don E. Alberts, "Kirtland Air Force Base: Its Origin and Activities," Research Reports, History of Albuquerque Exhibits Series, Vol. V, (The Albuquerque Museum, History Division, March 1981): 51; While Albuquerque would survive if Kirtland Air Force Base were to be shut down, this event would certainly devastate the city through both loss of revenue and jobs. And Kirtland has been on the chopping block at least once. The Kirtland Partnership Committee was formed in 1996, after the Defense Departments Base and Realignment and Closure program named the base as one that might possibly be closed. Fortunately for Albuquerque, Kirtland was not closed, and city and business leaders currently stand prepared to fight if the base is threatened again with closure. (<http://www.kpc.nm.org/press.htm>)

¹⁰¹ Monthly Business and Economic Report: "Focus: Sandia National Laboratories," *New Mexico Progress*, August 1984, Published by Surwest Financial Services, Inc.: 1.

¹⁰² John Shunny, "New Mexico's High Tech," *New Mexico Magazine* April 1985, 82.

convert solar energy into large-scale electricity, a technology that seemed decades away to a reporter at the time.¹⁰³ Energy research and development became a new area venture in Albuquerque, conducted by both small private firms and the gargantuan Sandia Labs. By 1979, Sandia was spending more than \$450 million annually in solar energy research.¹⁰⁴ Senator Anderson would have been proud.

	Albuquerque SMSA (1970)	Albuquerque Place (1970)
Baccalaureate Degrees Held	8,232	-
Some College	17,168	-
High School Completed (men over age 18)	28,812	-
Employed persons (over age 16)	-	89,617
Professional Workers	-	21,896
Engineers (in P.W.)	-	2,459

Table 8 Albuquerque’s population became increasingly well-educated over time.¹⁰⁵

Sandia contributed to Anderson’s beloved city in many ways. Sandia, for example, was a major reason for Albuquerque’s success in education. In 1971, the corporation’s main facility on base employed about 6,500 people. Within this workforce, one-fourth was professional or technical workers; one-fourth was technical support staff; and one-half was administrative, crafts, and clerical personnel. Everyone employed by Sandia had a solid college background, and those holding PhDs and MAs represented two-thirds of the workforce.¹⁰⁶ Sandia Labs grew in physical size as size, and increased

¹⁰³ “The Laboratories,” *New Mexico Magazine*, March 1976: 17.

¹⁰⁴ Simmons, *Albuquerque: A Narrative History*, 376.

¹⁰⁵ *Ibid.*, 33-537; 33-152.

¹⁰⁶ Pamphlet File, *Albuquerque*, Sandia Base, Sandia Laboratories, 1974.

its land holdings to 51,000 acres in 1978, however, employee count decreased to 6,200.¹⁰⁷ This slight decline can be attributed to growing automation and the recruitment of more highly educated workers. Still, the annual payroll in 1980 was a staggering \$165.5 million.¹⁰⁸ By 1985, New Mexico led the nation in technical workers per capita.¹⁰⁹ Not surprisingly, Sandia’s assets continued to rise. In 1971 structures and equipment were valued at \$245 million, and property holdings were up to 35,000 acres.¹¹⁰ Each few years, figures seemed to jump. In the following years, Albuquerque would only continue to grow, annexing land, encouraging residential building, and attracting new industries.

Year	# Employees	Payroll (m)	Plant Assets (m)
1965	7120	\$69.5	\$161.3
1970	6530	\$89.7	\$240.9
1975	5542	\$95.3	\$273

Table 9 While the number of employees at Sandia decreased between 1965 and 1975, both payroll and plant assets continued to grow. (Don E. Alberts, “Kirtland Air Force Base: Its Origin and Activities,” Research Reports, History of Albuquerque Exhibits Series, Vol. V, (The Albuquerque Museum, History Division, March 1981.)

In 1999, Sandia celebrated its 50th anniversary with all the fanfare of any wealthy and influential corporation—including the purchase of a special commemorative section in the *Albuquerque Journal* touting the Lab’s contributions to the state and city. Among other accomplishments, Sandia noted that it had contributed almost \$1 billion to the

¹⁰⁷ Leroy E. Apodaca, “Wage and Salary Administration in Two Research and Development Laboratories” (MA Thesis, University of New Mexico, 1980): 32.

¹⁰⁸ Alberts, “Kirtland Air Force Base: Its Origin and Activities,” 40.

¹⁰⁹ Shunny, “New Mexico’s High Tech,” 82.

¹¹⁰ Albuquerque, New Mexico. Defense Nuclear Agency. Lubbock, Texas: “An Unofficial Guide Published by Boone Publications, Inc.” a private firm, not DOD. May 1, 1971: 23.

state's economy in 1998.¹¹¹ And its contributions have continued. In the twenty-first century, Kirtland has become a key strategic weapons development center for America, employing over twenty-thousand military and civilian workers (including those employed at Sandia National Laboratories on the base). Kirtland houses the nation's largest concentration of nuclear weapons. According to the Washington-based Natural Resources Defense Council, there are an estimated 2,450 nuclear warheads of various types stored at the Kirtland Underground Munitions Storage Complex. Sandia National Laboratories (a titled it gained in 1979) is now managed by the Lockheed Martin Corporation for the US Department of Energy. Since its inception in the late 1940s, Sandia's role has expanded far beyond the development of nuclear weapons to include scientific and engineering research related to the nation's defense, energy, and environmental needs.¹¹²

All of this benefitted Albuquerque, and diversification of research operations at Sandia throughout the company's history has accounted for much of this success. Today, development continues up and over the Sandia Mountains to the East, and Rio Rancho to the northwest is also growing. The reasons for this continued northern trend include reasons that Livermore was *against* further expansion, such as "traffic congestion, increased resource use, loss of open space and habitats, and decline of older areas."¹¹³ Despite problems like these that afflict most of today's metropolitan areas, Albuquerque's economy has continued to expand. The city has continued to struggle to

¹¹¹ Chris Miller and Rod Geer, "Sandia Labs' 50th Anniversary—A Time of Reflection, Pride," Advertising Supplement in *Albuquerque Journal*, 11 July 1999: 3.

¹¹² Bryan, *Albuquerque Remembered*, 266.

¹¹³ Wade Patterson, "The Rise of the Regional City," *New Mexico Historical Review*, 82 1, Winter 2007: 29.

extend municipal services and infrastructure to accommodate the vigorous suburban development, particularly in its Northeast quadrant.

Bond issues, federal subsidies, and some tax increases have funded this effort, but the dramatic growth of the city's tax base and the encouragement of further suburban expansion north and northwest have helped offset the cost. In contrast to Livermore, Albuquerqueans wanted the city to grow. Sandia's growing presence forced Albuquerque's leaders to engage in big-time city building that required them to annex new lands beyond their traditional borders, pursue interstate highways, upgrade school curricula, and hire talented city planners. Sixty years later and with the Cold War a distant memory, the question is whether Sandia's leaders can continue to attract the kind of federal contracts that will keep its workforce and surrounding ancillary industries busy and prosperous. After all, even though the introduction of Sandia jump-started the city's economy, the numerous industries that have clustered there since World War II are key players in sustaining Duke City's prosperity. If procurement of federal funding continues and if Albuquerque's leaders maintain the city's economic momentum by attracting retirees and new types of industries, then the city's future will remain bright.

CHAPTER 5
CONCLUSIONS

As the Reagan and Bush administrations poured billions into nuclear weapons and Star Wars research in the 1980s, the California and New Mexico labs further boosted their host city's growth and prosperity. Of course, Albuquerque grew more than Livermore due to its support for land annexation and development. The US census clearly reflects the effect of the slow growth movement in Livermore. By 1980, the total population had increased by only 10,000 people from the previous year's census—to 48,349. Unsurprisingly, the city remained racially homogeneous in 1980, with a population of only 350 African Americans, not enough to warrant further statistical data (as was gathered for cities with black populations of 400 or more).¹ So, the city remained mostly white, upper-middle class, and educated.



Figure 27 First Street, at the intersection of South Livermore Avenue, bustles in the city's historic downtown. Photo taken by the author June 4, 2009.

¹ 1980 Census of Population and Housing. Section 1 of 2. *Census Tracts. San Francisco-Oakland, Calif. SMSA.* PHC80-2-321. Issued July 1983. United States Department of Commerce. Bureau of the Census, P-1; P-702; In later decades, census data more clearly demonstrates the impact of the slow growth movement in Livermore. In 1990, the population was 56, 714, and in 2000, the population was 73,345 and Livermore covered 24 square miles.

Educational statistics remained strong for the one-time rural valley. In 1980, the percentage of high school graduates in Livermore was steady, hovering around 84 percent. Adults tended to work in managerial and professional specialty occupations, as private wage and salary workers, and as government employees.² Because of advanced educational training and the nature of the research specialties at the Lab, median incomes for some census tracts in Livermore were significantly higher than those in other areas. For example, the areas in the central city and the land expanding to the far north of Livermore had average incomes of over \$20,000 in 1980. In contrast, the land to the Northwest, separated from the central city by First Street and Murrieta Boulevard, as well as the tracts directly south of the central city, below First Street and contained between Canal Street and Livermore Avenue, averaged about \$13,000 in yearly income.³ This disparity can be attributed to the age of the housing stock in these areas, with those clustered near downtown tending to be older and often historic.

Today, some white Livermoreans attribute the residential segregation of many neighborhoods not to racist practices but to the fact that many citizens were commuters in search of cheap housing in the Bay Area. However, the general consensus is that Livermore was simply too small to encounter the full range and severity of racial problems that many metropolitan areas experienced. There simply were not enough minorities present in Livermore to bring the full force of the civil rights movement to the town. John Shirley suggested that Livermore was not diverse in the 1960s, but was

² 1980 Census of Population and Housing. Section 1 of 2. *Census Tracts. San Francisco-Oakland, Calif. SMSA.* PHC80-2-321. Issued July 1983. United States Department of Commerce. Bureau of the Census: P-341; P-445.

³ *Ibid.*, P-566.

slightly more so in the 1970s. That trend continued into the twenty-first century, and he attributed the absence of a substantial African American population to the fact that “they like to live with their own, so they may prefer to live in Oakland...but they’re all welcome here, of course.”⁴

Also, as noted earlier, many workers chose to live outside the town, either due to inflated home prices or a lack of amenities in the city limits; as a result, Livermore has largely retained its small-town atmosphere. Despite business interests that would have preferred to see Livermore grow into a metropolis like Albuquerque, a strong community and civic spirit coupled with organizations such as SAVE have enabled it to remain a relatively small place. Nevertheless, Shirley argues that the city has been quite successful in attracting new industry, such as the headquarters of Comcast. He asserts that at the Chamber of Commerce, one could find “dozens and dozens” of new members who opened their businesses in Livermore. But Don Miller and Helen Tirsell respectfully disagree. They argue that developers, because they were not allowed to develop housing in Livermore without strict codes and controlled growth, “poisoned” the rest of the Bay Area against Livermore, branding the town as anti-outsider and anti-growth.⁵ According to Tirsell, developers told anyone who would listen: “Don’t go there. They’re no-growthers...if you work there, you can’t live there...which simply wasn’t true.”⁶

So while many in Livermore wanted to attract industry, others, including many labbers, deflected business away by their insistence that Livermore not become a

⁴ John Shirley, conversation with the author, February 12, 2010.

⁵ Don Miller, conversation with the author, February 11, 2010; Helen Tirsell, conversation with the author, February 12, 2010.

⁶ Helen Tirsell, conversation with the author, February 12, 2010.

commuter suburb and that it maintain sustainable infrastructure. So, unlike Albuquerque, Livermore's citizens largely rejected achieving metropolitan status to preserve a small town atmosphere, with its emphasis on uncrowded schools, unpolluted air, and a pleasing natural aesthetic, such as that provided by the valley's undeveloped hills and green space.

Thus, residents made a conscious decision about how they would grow after the introduction of federal installations they never lobbied for in the first place. Livermore did not have any boosters who actively pursued acquisition of the Naval Air Station or the Labs, yet the city's relative isolation made it a prime location for these facilities. Scientists in nearby Berkeley choose Livermore as the location of the LLNL on their own. So, Livermore was an exception to the idea that boosterism was a dominant factor in the growth of the urban West. In fact, the anti-growth grassroots movement won out in hindering further expansion. When these new facilities came to town, residents did not care what kind of industry they were, just as long as they would not disrupt Livermore's traditional small town atmosphere. However, due to the type of workforce that a nuclear weapons complex employs, Livermore was certainly influenced by the fact that its primary industry was a federal installation.

Former mayor Don Miller recalled that while the lab was not formally supposed to lobby for contracts, the Department of Energy probably lobbied on its behalf. Miller also asserted that the city officials were never preoccupied with the possibility that the labs would dramatically downsize or leave the valley, because "we do not live in a nice world, we do not live in a universal disarmament world."⁷ Former mayor John Shirley similarly noted that his administration never worried about the labs leaving either, albeit

⁷ Don Miller, conversation with the author, February 11, 2010.

for different reasons than Miller. He claimed that there was no need to lobby, because “Livermore is a unique city...if the labs left, I don’t know...there’s enough economic development to sustain the city now.”⁸ Also, due to Livermore’s location next to the metropolitan powerhouse that is the San Francisco Bay Area, it is likely that the city would be able to sustain itself without the labs. It could, if need be, turn into a commuter suburb if that were to happen. This is in contrast to Albuquerque, which is isolated in central New Mexico and is its own metropolitan area, one that does not have any proximate cities to turn to for help if the Sandia Corporation or Kirtland Air Force Base were to close. Perhaps this makes the issue of federal dependency more problematic in Albuquerque than in the California town. Former Livermore mayor Helen Tirsell would disagree, however, saying that “if we lost the labs, we’d be terrified. [When I was in office in 1973] we spoke to representatives and if there was talk about layoffs, we’d talk to the lab workers” about fixing the situation. For Tirsell, keeping the labs at least at their current employment rate was a source of continuing concern for Livermore residents and the City Council.⁹ This was especially poignant considering the work that SAVE continued to do throughout the years, limiting growth, because if residential development had been allowed to go on unabated, and the labs closed or downsized dramatically, Livermore might well have become a commuter suburb even with the other industry it has attracted.

But Livermore might not always remain mid-sized. Proposed development of North Livermore is an ongoing example of developers’ persistent efforts to build housing

⁸ John Shirley, conversation with the author, February 12, 2010.

⁹ Helen Tirsell, conversation with the author, February 12, 2010.

tracts there. Beginning in the late-1960s, Harlan Gelderman, a Danville-based investor, tried to construct a huge project for 50,000 people in North Livermore. This plan was rejected in 1969 even by a majority of pro-growth City Council members. But it did not stop Gelderman, who promised to shove the plan “down [the city council’s] throats.” Indeed, the developer was aggressive, petitioning Alameda County and then the City Council again in the 1970s, but to no avail. Other contractors submitted new plans for the area in 1981 and again in the early 1990s. While voters defeated this first proposal for “Las Positas New Town,” the city council in 1994 approved a downsized plan for 35,000 residents—despite strong public opposition. But in 2002, the slow-growth Council majority adopted the Urban Growth Boundary initiative, which gave Livermore voters the ultimate say in North Livermore’s future.¹⁰

Slow-growthers considered this reform a great victory, but others saw it as an unreasonable blockade against business interests and growth. In particular, John Shirley regarded North Livermore as a “perfectly logical place for development,” and felt the proposed housing was a “wonderful opportunity missed,” further cementing his disagreement with the imposed urban growth boundary. Miller and Tirsell once again disagreed. Miller was relieved that what he believed would be commuter homes, homes that would endanger public health with pollution and increased traffic, would not be built.¹¹ Tirsell similarly expressed anxiety that Interstate 580 would become even more congested than it is today if massive tracts were built in North Livermore. But even more than that, she wanted to safeguard the area’s green hills from the scars of growth. Today,

¹⁰ Robert A. Weber, “A brief history of North Livermore Valley, 1960’s to present,” 2006, <http://northlivermorevalley.org/history.html>, accessed February 16, 2010.

¹¹ Don Miller, conversation with the author, February 11, 2010.

she even suggests, perhaps optimistically, that current commuters living in Livermore might tire of their long drives and traffic, and start returning to revitalized city cores, such as the redeveloped condo districts in Oakland.¹² Only time will tell if this dream will be realized. In the meantime, however, there is little reason to assume that developers will halt their efforts to build in Livermore.



Figure 28 The undeveloped hills of North Livermore Valley. (<http://www.northlivermorevalley.org>)

In fact, there is some concern that they may eventually succeed if there is not a committed activist base supporting slow growth. While Shirley insists that the urban growth boundary initiative would be “hard to get rid of,” Tirsell worries “if there are young people who will hearken to the cause.” But she hopes that “we’ll keep fighting...People have not forgotten that there were triple sessions in the schools...We all remember when the air was black out there.”¹³ It remains to be seen whether or not Livermore will succumb to business pressure to grow more quickly and whether the younger generation and the large number of commuters will show the same dedication that members of the SAVE movement have displayed since the 1960s. Clearly,

¹² Helen Tirsell, conversation with the author, February 12, 2010.

¹³ John Shirley, conversation with the author, February 12, 2010; Helen Tirsell, conversation with the author, February 12, 2010.

Livermore's infatuation with slow growth, much like Portland's, contrasts markedly with the experience of other western cities and to the models of Nash and other historians.

Roger Lotchin revised Gerald Nash by demonstrating that western efforts to secure defense plants antedated World War II (as in the case of San Diego and the Navy). However, while both he and Carl Abbott agree that boosterism played a significant role in the West's postwar growth, Lotchin also asserted that pre-1940s defense installations in places like the Bay Area encouraged the military locate new facilities nearby without mayors or chambers of commerce even requesting it. Carl Abbott, however, countered that pre-existing industrial settings did not play as significant a role in determining where installations would be situated as did the factors of elbow room, proximity to engineering schools, and "vigorous local promotion."¹⁴ While the Naval Air Station's presence in Livermore probably influenced Ernest Lawrence's decision to build the Lab there, so did the city's rural location and its proximity to the University of California, Berkeley campus.

Albuquerque does not quite fit the model either. Despite the fact that Albuquerque promoters lobbied for federal funding in the years after Sandia's arrival, the initial decision to move the Z Division to Duke City had little to do with boosterism. Instead, the proximity of Los Alamos and existence of Kirtland Base were deciding factors for the government to establish the Sandia Labs in the city. As in Livermore, residents embraced the introduction of a federal installation, yet more than their counterparts in Livermore, locals used their lab as a springboard for attracting new industries, annexing land, and becoming a metropolitan area. The Northeast Heights became the "science suburbs" in

¹⁴ Carl Abbott, *The Metropolitan Frontier*, (Tucson: University of Arizona Press, 1993): 8.

Albuquerque, and the lab workers who resided there soon became a powerful voting bloc, drawing away from downtown's traditional hegemony.

Without the initial introduction of the Sandia Labs, Albuquerque may have ever achieved its metropolitan status in the twenty-first century. The labs forced the city's government to expand and provide services that suburbanites demanded in the postwar years. Unlike Livermore, with its relative proximity to the San Francisco Bay Area, there was no major city nearby to offer amenities to new upscale, highly-educated residents, so Albuquerque had to do it. This may explain why its borders grew swiftly outward along with its business sector and population, without generating a slow growth movement. Albuquerque demonstrates another path a martial city could take—one in which a city capitalized on its unsolicited attention from the Pentagon and grew into a southwestern metropolis.

Historians should consider new frameworks to integrate the Cold War West more coherently into the national narrative.¹⁵ More research is needed regarding how defense installations have affected people, the environment, and economies. Furthermore, historians need to determine what the nuclear West's past means for the region's future. Of particular interest is how defense-based economies can cope during periods of peace and disarmament, such as the 1990s, when defense spending sharply declines. The story of the Atomic West is relevant for the entire nation. Should Congress continue to approve spending billions of tax dollars on defense for the sake of preserving their constituents' jobs? How far-reaching, costly, or reversible are the changes that have been made to the

¹⁵ Two fine collections of essays are available on the Cold War West that formally opened a dialogue on the subject. See, Kevin J. Fernlund, ed., *The Cold War American West: 1945-1989*, (Albuquerque: University of New Mexico Press, 1998), and Bruce Hevly and John Findlay, eds., *The Atomic West*, (USA: University of Washington Press, 1998).

western landscape during nuclear weapons buildup? More studies that take into account changing demographics and urban identities in the Atomic West are needed to update and reconstruct some of the traditional historiographic interpretations of postwar western cities and defense spending.

EXHIBITS



Figure 29 Downtown Livermore holds true to its rodeo roots, which it has been hosting since 1918, in 2009. Author's collection.

Live longer in Livermore,
Inland valley of pleasantness,
Vintage of grain in store,
Ever God's sunshine to bless.

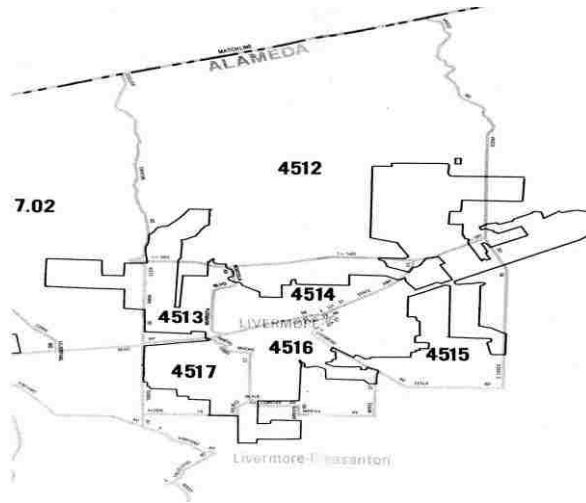
Live where the air is freer,
Out where the West begins –
Nearer the stars in the heavens,
Grandeur the twilight wins;
Evening comes with its shadows,
Restfully soothing and calm.

In peace and contentment unending,
No would be Time heals its balm.

Live longer in Livermore
In the valley of vigor and vim,
Vineyards and homes and grain fields,
Ever stretch to the mountains' rim.
Reviewing the sunshine of gladness,
Morning fails not to bring in the day,
On hillside and valley and farmland,
Rejoicing in life's peaceful way,
Ever contented, the people live longer in
Livermore.¹

¹ Indeed, there were early booster efforts in Livermore that ultimately failed by 1940. An example of this early twentieth-century boosterism is evidenced in this poem, "Live Longer in Livermore," by Nora Rose McCaffrey, July 19, 1923, Reproduced in the Livermore Heritage Guild Newsletter, January 1984; Republished with the additional info: "The 'Live Longer in Livermore' slogan was used by the Chamber of Commerce, as seen in this quote from the 1927 brochure reproduced by the Guild... 'Livermore, California..between the sea and the San Joaquin 'The Home of Heath and Industry' Welcome to Livermore. Prosperous and Growing Community where Factories from Crowded Cities Find Ideal Location. LIVE LONGER IN LIVERMORE.'"

Livermore Census Tracts in 1980



Census Tract	Characteristics
4513	Known for affordable housing in the late 1960s; however, it is historically a transition place for Livermoreans and thus has become somewhat blighted in recent times.
4514	Contains older housing stock where many people who worked at the Labs in the 1950s and 1960s found homes. However, the area from Murrieta Boulevard to Livermore Avenue north of Railroad has become notoriously blighted within the last thirty years.
4515	Contains East Avenue, and this area extends out to the Lab; however most “labbers” lived in the “better” sections of 4514.
4516	Homes in this census tract were built from the beginning of the town in the late 1800s until the 1930s. Many are considered historic.
4517	Granada built these tract homes in the 1960s, and those who could afford them, moved into this prosperous area of town.

Table 10 1980 Livermore Census Tracts: Livermoreans Gary Drummond and Susan Canfield ventured to guess that the disparities between different areas of town can be explained by the age of the homes in particular census tracts, and areas which have contained a large number of affordable housing or apartments.

Map of Albuquerque

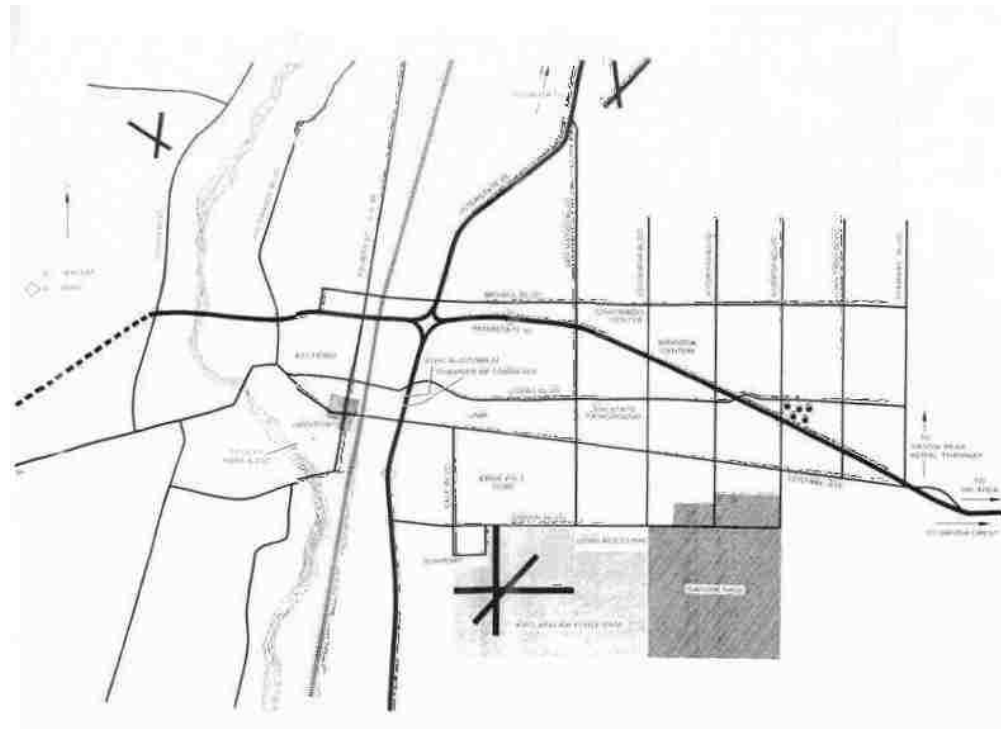


Figure 30 Sandia Corporation provided foldout maps of both the city of Albuquerque and a detailed overview of Sandia Base for new workers in a 1971 brochure. This map shows the city of Albuquerque after I-25 and I-40 were constructed. Sandia Base is outlined in the bottom-right corner in dark gray. (Albuquerque, New Mexico. Defense Nuclear Agency. Lubbock, Texas: "An Unofficial Guide Published by Boone Publications, Inc." a private firm, not DOD. May 1, 1971.)

Map of Sandia

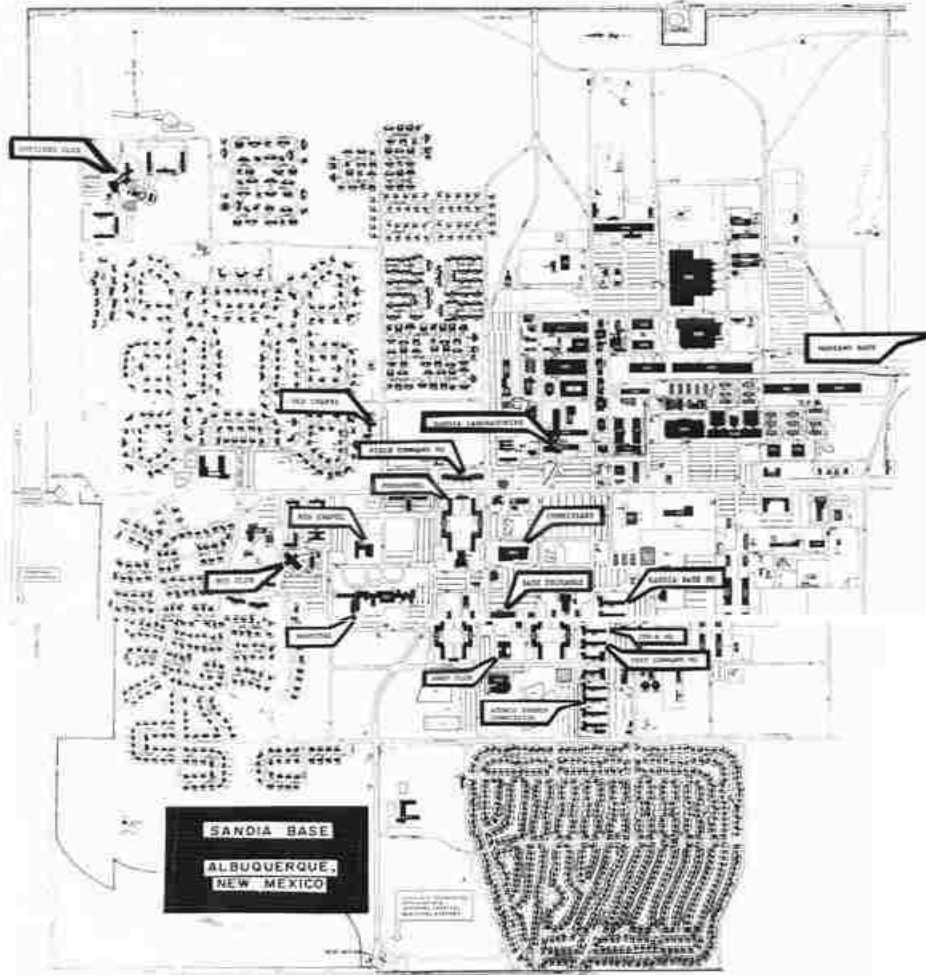
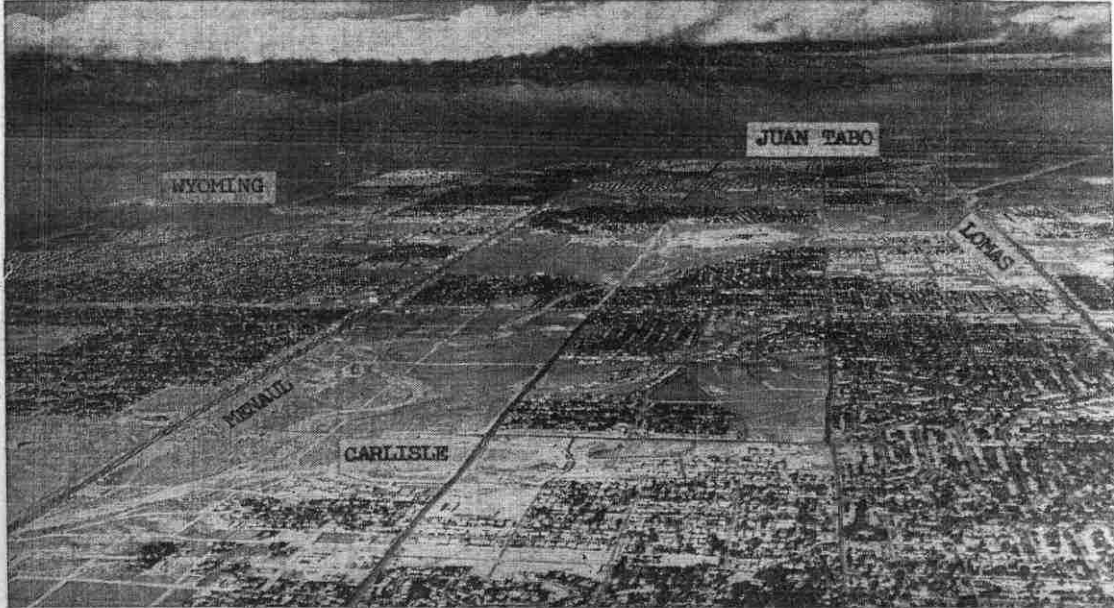


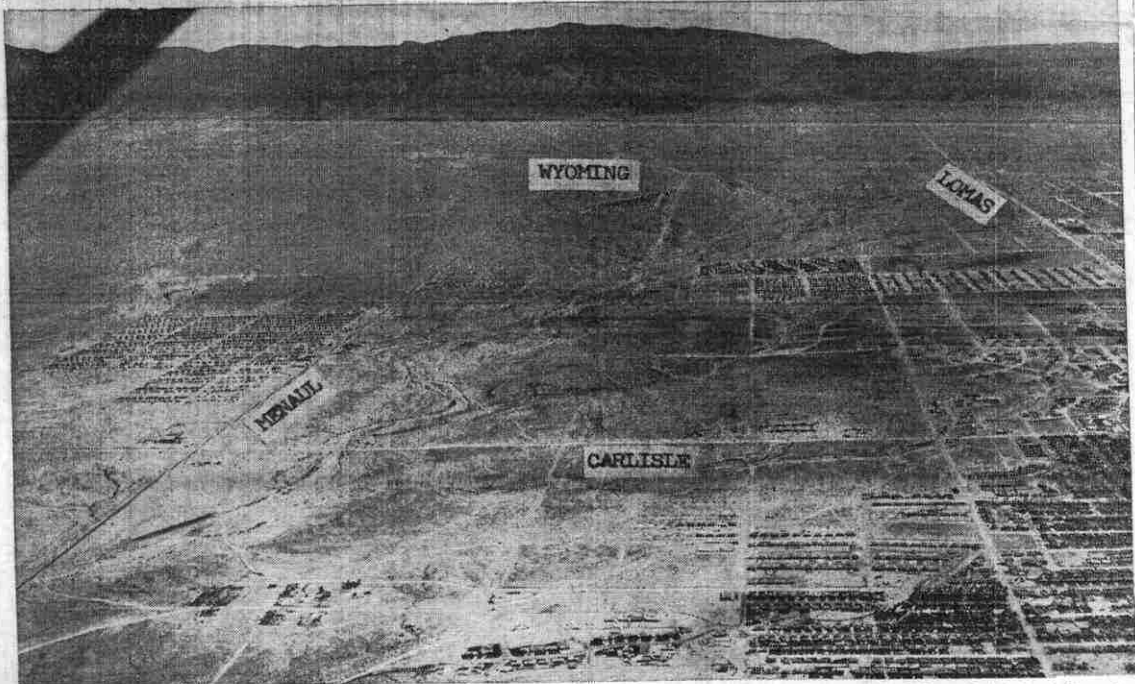
Figure 31 Sandia provided foldout maps of both the city of Albuquerque and a detailed overview of Sandia Base. Sandia Base is located south of Southern Avenue, bound to the west by Louisiana Boulevard and bound to the east by Eubank Boulevard. While Sandia Complex shows a southern border, the “actual” southern reaches of Sandia and other facilities are left to the imagination. Development in the Northeast can be attributed to the prevalence of “off-limit” government lands south of Sandia, Kirtland, and Manzano. (Albuquerque, New Mexico. Defense Nuclear Agency. Lubbock, Texas: “An Unofficial Guide Published by Boone Publications, Inc.” a private firm, not DOD. May 1, 1971.)

Photos Show Growth of NE



A SPRAWLING CITY covers the Northeast Heights section of Albuquerque in this graphic aerial photo made recently by Dick Kent, local photographer. Development has left but a rela-

tively few "islands" of bare mesa from Carlisle looking eastward to Juan Tabo. There is much development north of Menaul (at the left).



THE HEIGHTS IN 1950 presented a far different picture as evidenced in this aerial photo taken by local photographer Harvey Caplin, from almost the same angle as Mr. Kent's 1960 photo.

Only Bel Air was in existence north of Menaul (at the left) and there were only a few widely scattered developments in the entire area. Juan Tabo Blvd. was not even in existence.

Figure 32 Even in 1960, it was obvious that the growth of the city was unprecedented, and it showed no likelihood of halting. ("Photos Show Growth of NE." *Albuquerque Tribune*. No Date.)

Sandia Report in the *Albuquerque Progress*

Sandia wrote an issue of the *Albuquerque Progress* in 1951, in which it took a public relations move by allowing the public to know a little bit about what was happening behind the heavily guarded gates. However, Sandia only offered a few bullet points of information, including:

- **Ownership:** “Sandia is a wholly-owned subsidiary of the Western Electric Company operating Sandia Laboratory for the AEC on no-profit, no-fee basis.”
- **Its Payroll Figures:** “[Sandia] has a payroll of more than \$1.5 million per month, or \$18 million per year. The AEC Sandia Field Office personnel were paid an additional half million dollars during 1950.”
- **Info on the Armed Forces Special Weapons Project:** “[It is] a principal military tenant of Sandia Base (a unified command including representatives of all branches of the Armed Services) has a total military and civilian payroll of \$708,333 per month or \$8.5 million annually.”
- **Plans For the Future:** “The Santa Fe Operations Office, which administers the field weapons organization for the US Atomic Energy Commission, is being transferred from Los Alamos to Albuquerque, where it will occupy buildings on East Gibson formerly occupied by Sandia Laboratory’s ‘West Lab.’ Some 300 employees are bringing to Albuquerque a payroll approximating one and a half million dollars annually.”
- **How Sandia Helps Albuquerque:** “Kirtland Air Force Base, headquarters of the Air Force Special Weapons Command, and closely related to Sandia in the atomic energy program, adds nearly \$10 million a year in payrolls, military and civilian, to the Albuquerque community.”
- **Projected Growth of the Base:** “The permanent buildings and utilities of the military on Sandia Base have grown to meet the increasing tempo of National Defense expansion. In the fiscal year 1950, the expansion program required an expenditure of approximately \$7 million. In addition, there is an expected expenditure of approximately \$3 million for the fiscal year of 1952.”
- **Its Grassroots Initiatives:** “Sandia Corporation purchases many supplies and much equipment locally, through normal government bid procedures. During the year 1950, orders valued at \$1.8 million were placed with New Mexico suppliers.”²

² “Sandia, Silent Partner in Albuquerque’s Rapid Post-war Growth, Booms Commercial Construction,” *Albuquerque Progress*. XVIII 9 9/51.

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¹ The *Livermore News* was published independently from approximately 1951-1962, at which time it was purchased by the *Livermore Herald*. The *Livermore Herald* subsequently changed its name to the *Livermore Herald & News*, later the *Herald News*, and yet later to its current incarnation, the *Tri-Valley Herald*.

² While the Livermore Heritage Guild has an oral history collection cataloguing the experiences of citizens in Livermore, the interviews are not transcribed and an index is not available. Due to time constraints, this researcher was unable to utilize this resource.

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